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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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German Chemical Industry

THE *Report on Economic and Financial Conditions in Germany* to July of 1927, prepared by J. W. F. Thelwall and C. J. Kavanagh, British Commercial Secretaries at Berlin, and now published by the Department of Overseas Trade (H.M. Stationery Office, pp. 225, 3s. 6d.), describes the period May, 1926, to June, 1927, as one of uninterrupted improvement in every branch of German trade and industry. In its general aspects this carefully written survey of Germany's battle with financial, commercial, and technological problems is a document that no serious student or industrialist can afford to miss. On its purely chemical side, it is of particular interest as indicating, as far as any external authority can, the position of German chemical and fuel technology and the German potash industry. The special chapters on these subjects are by Mr. Kavanagh, who writes with knowledge and judgment.

Although considerable attention is being given to the hydrogenation of coal and lignite and to catalytic reactions for the production of fuels and oils from coals, strict reticence is maintained on the yields of the process, and only in the Bergius and Fischer systems have the general principles of operation been made known. The process for synthesising liquid fuel from brown coal, for which a large plant is being erected at Leuna, is considered to hold out an early promise of commercial success. The only important announcement made respecting it is that the Chemical Trust's present process is not to be identified with the previous patents on the catalysis of carbon monoxide and hydrogen under pressure, but that a different and more promising line of experiment has been adopted. This process is believed to be one combining the hydrogenation of brown coal with catalytic treatment at determined periods of the hydrogenation process under varying conditions of temperature, pressure and velocity to secure definite products. For this method a greater elasticity of manipulation is claimed, leading to the production of low flash point hydrocarbons of the aliphatic and aromatic series. Simultaneously with the Bergius and I.G. processes, Fischer and Tropsch are also engaged in investigations of their own, and a 30-ton experimental plant for the hydrogenation of coal is being installed in Duisburg. While the production of liquid fuels direct from coal is the subject of careful research, motor fuels have in addition been produced by the hydrogenation of crude tars from low temperature distillation plants. The possibilities of correlating the production of gas and tars from low and high temperature distillation plants with the use of the resulting coke and coke oven gases for the hydrogen basis of synthetic ammonia and synthetic fuel production, are receiving consideration. So far synthetic ammonia production has been initiated at the Mont Cenis mine, where the coke oven gases are being prepared by the Bronn-Linde process, and delivered sufficiently pure for catalytic treatment according to the Casale or Mont Cenis process. Although these investigations are only in the early stages, the knitting together of coal and chemical research is regarded as promising great possibilities.

With regard to chemical industry in general, the position has been affected by the change from fine organic chemical manufacture to the production of artificial fertilisers and the displacement of natural by synthetic products. The most important phase of development lies in the trend of research and the investigations into new ballast-free and compound fertilisers, synthetic fuel production, and the interweaving of chemical processes so that the surplus products of reaction from one process may be harnessed to another. Attention is drawn in the report to Germany's good fortune in having at the head of its chemical industry men of exceptional vision with wide experience of applied chemical science, who are able to formulate definite lines of investigation and correlate the observations made over a very wide field of research to the solution of new problems.

While the German Chemical Trust has had to face important losses of markets in the dye trade, it has developed in other fields, notably in synthetic nitrogen and combined fertilisers, synthetic hydrocarbons, resins and perfumes, and pharmaceutical products. With respect to the rumours of international co-operation, it is suggested that joint efforts in synchronising research might well be of mutual benefit.

A separate chapter is devoted to the German potash industry. This shows that although in 1926 the very favourable results achieved in 1925 were not attained and sales show a diminution of some 125,500 tons, they far exceeded the sales of 1924. Moreover, in view of the favourable developments in the first quarter of this year it would appear that future results will be still more satisfactory. The Alsatian potash industry has undergone a considerable increase, but from the other European supplies Germany is understood to have little to fear. The inquiry into the prices of potash led to the Government to agree to an increase which amounted to an average of some 9½ per cent. and came into force on December 23, 1926. The outstanding development in mixed fertilisers has been by the I.G., which is marketing under the name of "Nitrophoska I.G.," a fertiliser with a potash content of from 21·1 to 25·6 per cent., 14·7 to 17 per cent. nitrogen, and 10·2 to 11·7 per cent. phosphoric acid. This, it is said, is proving popular, is expected to lead to a higher potash consumption, and may eventually result in a closer connection between the Potash Syndicate and the I.G. For the first time since the war the industry has been in a position to pay dividends, a result almost wholly attributable to the foreign loan.

The American Chemical Position

In contrast with the position of the German chemical industry, the interest of which lies in possible future developments, the new *Report on Economic Conditions in the United States of America*, just issued by the Department of Overseas Trade (H.M. Stationery Office, pp. 106, 3s.), looks singularly unexciting. The report is the work of Sir J. J. Broderick, Commercial Counsellor at Washington, and Captain A. J. Pack, Commercial Secretary, and considering the vastness of the field is of modest proportions.

In the chemical industries of the United States as a group, we are told, employment is particularly good. With the exception of producers of materials for the fertiliser industries and producers of industrial alcohol, makers of most of the principal industrial chemicals have enjoyed a long period of large business and satisfactory earnings. In the face of overproduction, light demand, and increasing costs of raw materials, notably of blackstrap molasses, producers of alcohol are not favourably situated, and the outlook at the moment is for restricted profits for some time. The other branches continue to be fully employed with large bookings on contract for the supply of materials to the paper-producing industries, the tanning trades, silk and artificial silk goods makers, rubber manufacturers, and the cotton goods industry, all of which are showing marked activity.

In the coal tar dyes and chemicals branch, the record of last year is described as excellent. It showed a volume of production in excess of that of the previous year, and approaching the highest twelve months' volume ever attained. The year's aggregate output of coal tar products was 123,000,000 lb., 20 per cent. consisting of colour lakes, synthetic tanning materials, and phenol-condensation resins. Seventy-two per cent. consisted of synthetic dyes, the vat-dyes group showing a gain of 50 per cent. over 1925, and the average price of coal tar dyes as a whole dropping from 46·6 cents a pound in 1925 to 42 cents in 1926. Export prices declined still more, and were about 11 per cent. below the average of the preceding twelve months. Competition of German manufacturers is said to be the cause of the drop in export values. The unit value of dyes in foreign markets has been reduced almost one-half in the last five years, and reports from China and other parts of the Far East indicate that American manufacturers hold their place in those markets only through an almost complete sacrifice of profits. Money wages in the chemical industries as a group are, on a general average, about 120 per cent. higher at the present time than in 1914.

A Successful Club

The annual report of the Chemical Industry Club, which is to be submitted to the annual meeting on Monday, reveals quite a satisfactory financial position, the surplus balance for the year being £86 5s. 10d. It also shows that the membership remains persistently somewhere between 700 and 800. The inference is that, although the Club almost immediately met a decided want up to this limit, it is doubtful whether it can look, under present conditions, for any vast extension. Suggestions have been made from time to time of some large central institution which would become the recognised social meeting place for all chemists. They have not materialised. While, however, these distant visions show little signs of drawing near, the Club itself is a present reality, comfortably paying its way, possessing a stable and contented membership, managed by a good committee, and supplying all the privileges of a convenient London club at a very moderate fee. At a time when many London clubs have difficulty in making their revenue and expenses balance, the Chemical Industry Club may be congratulated on the continued maintenance of its position and services. The management can hardly improve on its policy of efficiently meeting present needs, and leaving visionary needs to the future.

Imperial Synthetic Fertiliser Campaign

The amazing energy that Sir Alfred Mond is displaying in more than one branch of public work associated with the organisation of Imperial Chemical Industries is impressing not only the members of the chemical industry, but the whole nation. Outside the immense internal work of the combine, he has within the past week or two taken the initiative in launching an important Labour Programme, in starting a national movement for establishing peace in industry, and in inaugurating a plan of scientific agriculture for the whole Empire. These great efforts, each one big

enough to absorb the capacity of any single leader, are taken in his stride.

The scale on which this work is being conceived could not have been more impressively presented than at the luncheon Sir Alfred gave in London on Wednesday to the delegates to the Imperial Agricultural Conference, following upon the visit of the delegates to the Billingham works the previous week. At this remarkable gathering one saw the idea of imperial agricultural research represented by research authorities from every part of the Empire, with several from foreign countries. These are the men who are studying the infinitely variable conditions of soil, climate, and crops in every part of the Empire, and whose business it is to find out what is needed to secure the highest degree of productivity and what crops are most suitable to this or that set of natural conditions. Quietly and confidently, facing this assembly of Empire experts, Sir Alfred Mond offered this challenge in the name of British chemical science: "Tell us," he said in effect, "what it is chemically that the soils of the Empire require to secure the highest level of production and the most profitable forms of cultivation, and it will be our duty and business to supply the need." Such a challenge enables one to appreciate both the reality of the imperial mission that the great chemical amalgamation has entered on and the confidence of Billingham—the creation of only a few years—in its power to meet the needs.

Chemical Research in India

READERS of THE CHEMICAL AGE will be glad to hear that India is slowly recognising the importance of scientific research, especially chemical research. It is due to her ignorance of the latest improvements in industrial chemistry that India has to export a substantial portion of her produce as raw materials and not as manufactured goods, that more than half of her fisheries, forest, and mineral resources remain untapped. Sound and progressive development of native resources can only be built upon a solid industrial organisation, but for this a liberal provision is needed of productive processes embodying the latest discoveries, together with machinery and implements of the latest types.

As a result of this new movement in India to introduce modern art and science into productive processes, the Government of Bengal has recently opened a chemical research laboratory in Calcutta, under the management and supervision of Dr. R. L. Dutta. According to a communication from the Director of Industries, Bengal, the laboratory is fitted with the latest type of apparatus. The communication further states that the Government is prepared to obtain all such equipment as may be necessary to enable the staff to investigate any chemical research problem the solution of which might have a bearing on the economic welfare of the province. The industrial community is invited to submit for solution any problems that arise in actual practice, or to suggest fresh lines of investigation into the utilisation of the raw materials of the province. The Government Industrial Chemist is also willing to visit factories in which advice is required either on technical problems or on the introduction of improved machinery or processes.

Synthetic Fuel at Last?

THE inquiries as to whether the synthetic fuel produced in Germany amounts to a commercial proposition are partly, at least, answered by a report from Berlin. This indicates that Herr Kimpel, the winner of two events at a meeting organised by the German Automobile Club on a five-mile track in the Taunus, near Frankfort, used synthetic motor fuel, produced by the I.G. Farbenindustrie at the Leuna works. As he succeeded in beating his own record, set up at last year's meeting, it may be presumed that it worked satisfactorily, and this is in accordance with what we have heard from time to time about the fuel produced broadly on the Bergius principle, as modified and adapted by the I.G. in its experimental work. A solitary achievement of this sort, though notable, does not carry us commercially very far. To produce a few gallons for an experimental trial is obviously a very different thing from regular production in commercial qualities. Moreover, the vital question is whether the new fuel can yet be produced in quantity at a competitive market price. Until information is available on these points, the significance of a single racing success cannot be determined. A point, however, not to be overlooked is that the Germans are pegging away at the problem.

The Calendar

Oct. 31	University of Birmingham. Chemical Society: "Poisons." R. S. Tipson.	University, Birmingham.
31	Chemical Industry Club: Annual General Meeting. 8 p.m.	2, Whitehall Court, London.
31	Institute of Chemistry (Leeds Section) and Society of Chemical Industry (Yorkshire Section): "Flame." Oliver C. de C. Ellis. 7.15 p.m.	Chemistry Lecture Theatre, University, Leeds.
Nov 1	Mineralogical Society: Anniversary Meeting. 5.30 p.m.	London.
1	Society of Chemical Industry (South Wales Section): "The Care of the Eyes in Industry." T. Lewis. 7.30 p.m.	Technical College, Cardiff.
1	Institute of Metals, North-East Coast Section: G. Burns, "The Mechanical Properties of Metals at High Temperatures." 7.30 p.m.	Armstrong College, Newcastle.
2	Society of Public Analysts. 8 p.m.	St. Mary's Hospital, London, W.2.
2	Empire Industries Association: Sir Alfred Mond.	Cannon Street Hotel, London.
2	Institution of Chemical Engineers: Annual President's Reception.	London.
2	Ceramic Society: "Continuous Biscuit Firing." 8 p.m.	North Staffordshire Technical College, Stoke-on-Trent.
3	Society of Dyers and Colourists (West Riding Section): "The Synthesis of Sugars from Carbonic Acid by Means of Light." Professor E. C. C. Baly.	Midland Hotel, Bradford.
3	Chemical Society. 8 p.m.	Burlington House, Piccadilly, London.
4	Society of Dyers and Colourists. Joint meeting with Literary and Philosophical Society, Society of Chemical Industry and the Institute of Chemistry (Manchester Sections). "Some New Principles in Chemo-Therapy." Professor A. G. Green and Myer Coplans. 7 p.m.	Blackfriars House, Blackfriars Street, Manchester.

Prevention of Accidents in Chemical Laboratories

By Dr. J. W. Stillman

The following article gives the more important points in a contribution to the Chemical Section of the National Safety Council of America by Dr. J. W. Stillman, of E. I. du Pont de Nemours and Co., of Wilmington, Delaware.

In discussing this subject, for the sake of completeness, it will be necessary to review many precautions which are well known and probably generally practised. In one sense this repetition is of real value in familiarising those who are responsible for the manufacture, handling and use of chemicals with the rules of safe procedure. It is proposed in this paper to make a rather complete survey of the operations which are common to chemical laboratories.

The first topic to be considered should be the design of the building to be used for laboratory purposes, but this varies so much that it is difficult to outline a standard plan. One or two essential points can be mentioned. It is unwise for laboratory rooms to open out of another room which is used for laboratory purposes, because in case of fire in the outer room, escape from the other rooms might be cut off. The same thing applies to the arrangement of tables within the rooms. Aisles between tables should be open at both ends. All exit doors should open outward and fire extinguishers should be placed at accessible points, particularly good locations being beside doors or windows where they can be reached from the outside.

Ventilation

Adequate ventilation is very necessary in the chemical laboratories where the fumes, which are the product of many reactions, are in most cases at least irritating. Hoods equipped with an exhaust fan should be a part of the permanent equipment. A new method which has proved to be very satisfactory is to have the exhaust flue built in behind the rear wall of the hood with intake openings in the form of slits about three-quarters of an inch wide and graduated in length so as to give a uniform draught.

In cases where there is considerable amount of a poisonous gas being used and where there is danger of the gas escaping, as for example when carbon monoxide is being used as a raw material for catalytic reactions, a special ventilating system designed to exhaust the entire air of the room in a given time should be installed. This gas is usually prepared at or near the point where it is to be used, and is a treacherous poison because it has no colour or odour to act as a warning. A wise precautionary measure is to have a gas mask, equipped for protection against the gas likely to escape, placed outside the laboratory and plainly marked, so that if it is necessary to enter the room when it is filled with a poisonous gas, the equipment to do it safely will be at hand. Also, in case an accident should occur, those who are working with this gas should be provided with inhalation apparatus designed for the treatment of carbon monoxide poisoning and should be instructed in first aid methods.

Untidiness and its Consequences

Untidiness, which usually is the result of carelessness, is repulsive to almost everyone, but that it can be a contributory cause of accidents is many times overlooked. Neatness, which will of course promote greater efficiency in the worker, should be classified as one of the primary requisites of safety in the chemical laboratory. When chemicals are spilled, the remains immediately should be cleaned up. If stray particles of various kinds are allowed to accumulate over a period of time, mixtures may result which will of themselves start a fire, which, being communicated to scraps of paper or other waste, will spread rapidly. Special care should be exercised when using sodium, sodium peroxide, phosphorus, etc., to see that all strays be collected and disposed of.

It has recently been advised that if metallic mercury is spilled in handling, every effort should be made to have all of it cleaned up on account of its poisonous qualities. It has been known that mercury is poisonous if taken internally, but the idea that liquid mercury exposed in the open room would give a concentration of vapour which would be dangerous, has caused some discussion. Evidence has been brought forward which tends to show that sufficient mercury is volatilised from scattered drops in the room to give a concentration of mercury in the air which will cause mercury poisoning. Precautions should be taken to reduce the amount of mercury spilled to a minimum and to avoid keeping it in open vessels. The floors and tables of the laboratory should not have cracks or depressions which will permit the trapping of waste chemicals.

The work table should be kept free from apparatus or chemicals which are not actually in use. When apparatus is set up it should be placed well back from the front edge of the desk. All bottles should be marked with a label which is easily legible. If a rule is adopted that the janitor is permitted to discard the contents of any bottle having no label, the habit of carefully marking the bottles will soon be learned by the chemists. Only small stocks of chemicals or flammable liquids should be kept in the laboratory. The stock of reagents should be classified and arranged in a neat, orderly manner in a cool, dry part of the laboratory. The flammable solvents should be segregated and should be so located that in case of fire exit from the room will not be cut off.

Storing Apparatus and Chemicals Safely

Glassware for immediate use should be stored in a way to avoid breakage. Beakers, flasks, and bottles can be taken care of by providing a large closet at the side of the room which is equipped with shelves and doors to keep out dust. Condensers and complete units of glass apparatus such as Soxhlet extraction apparatus should be kept in drawers, preferably with cotton on the bottom. No more apparatus should be placed in the drawer than can conveniently be arranged on the bottom. In other words, one piece should not be piled on top of the other. Pipettes and burettes can be protected by equipping the drawer with strips of wood running lengthwise of the drawer in which are cut grooves just large enough to admit the piece of apparatus in question.

Large stocks of standard apparatus and chemicals for the use of the whole laboratory organisation and selected according to the nature of the work being done, should be kept in a central storeroom in charge of a competent stores keeper. Excess stocks of either apparatus or chemicals when no longer needed should be returned to the central storeroom. As regards the latter, all volatile flammable liquids should be suitably protected and kept in a proper building located at a reasonable distance from other buildings. It is customary practice to store chemicals by arranging them alphabetically according to their metallic constituents. It is debatable whether this is the best method. Included in the list of chemicals which are ordinarily used will be many oxidising agents belonging to such classes as nitrates, chlorates, permanganates, peroxides, etc. Most of the compounds of this sort would not start a fire of themselves, but on account of their ability to give up oxygen when heated, as a class they will promote and intensify a fire once it has been started. The suggestion, therefore, is made that it perhaps would be better to take at least the extra supply of oxidising agents out of their alphabetical classifications and place them together in a fireproof building, room or compartment. Glassware should be kept on shelves with raised strips across the front to prevent any pieces from being knocked or jarred off.

Handling Specially Dangerous Chemicals

Metallic sodium and potassium have to be kept under kerosene. The safest plan is to transfer the sodium or potassium, when received, to glass jars equipped with tightly fitting glass stoppers. Each jar should then be set in an enamel bucket for protection in case the glass jar breaks. If kept in tin cans, the kerosene may leak out unnoticed. A separate fireproof building should be provided for the storage of large quantities of sodium and potassium, and frequent inspections should be made. Yellow phosphorus must always be kept under water, but phosphorus and sodium must be kept in separate buildings because of the danger of adding water to a sodium container by mistake. Care should be taken in winter to avoid breakage of the bottles through freezing of the water. A double container, as suggested above, is a wise precaution.

Accidents Due to Careless Handling

An accident which illustrates what may happen through the careless handling of chemicals can be described appropriately at this point. This accident occurred in the student laboratory at a large university. A young woman student was carrying out an experiment which called for the heating of a mixture of mercuric sulphide and lime in a glass tube closed at one end. The mercuric sulphide was issued to the students by an attendant in the storeroom. The lime was placed in bottles on the side tables and was obtained by each student for himself. Some students were working on previous experiments, which called for the use of potassium chlorate, which was also on the side table in bottles. It is supposed that the young woman selected the wrong bottle, because an explosion followed the heating and, as a result, the young woman lost one eye.

The contents of all bottles on the side tables were examined after the accident and found to contain nothing but the reagent called for by the label. The unused portion of the mixture heated by the student was found to contain mercuric sulphide and potassium chlorate but no lime. The student brought suit against the university on the basis that there had been negligence on the part of the instructors in not analysing the contents of every bottle on the side table to see that they agreed with the label. The lower court awarded damages of $25,000 to the plaintiff, but this was later reversed by the higher court when the decision was appealed.

The danger lies not entirely in the selection of the wrong reagent from several placed at the disposal of the students, but also in the fact that there are students who, anxious to "see what will happen," will try mixing together various chemicals which they find accessible. One institution has a plan under which a list of chemicals which cause danger reactions is withheld from the students except on permission of the head of the department and a signed statement by the student that he is familiar with the chemicals and their characteristics and will not hold the college responsible for accident.

Training in Safety Methods

In the training of chemists, there has been a general lack of instruction based on the question of safety, and this ought to be remedied. The so-called physical and chemical properties of the various common reagents which are to be the chemist's future tools are thoroughly studied but very rarely is mention made of the physiological properties. Certain compounds such as potassium cyanide, which are especially dangerous poisons, are warned against, and in the same way a few of the more flammable and explosive compounds are mentioned specifically. What is required is a general classification of chemical compounds with emphasis laid on their safe handling. For example, it is well known that oxidising materials react readily with reducing materials. Now, from the point of view of safety, it might be added that this reaction is usually accompanied with the evolution of heat, which may lead to spontaneous combustion, and in many cases if external heat is applied the reaction may proceed with the violence of an explosion.

It seems to the writer that the college or university is the proper place for this safety instruction to be given, for it is from these institutions that the chemical industry draws its workers, and the new employee is not fitted to take his place in the industry where he may endanger other lives as well as his own, if he does not understand the materials he is about to handle.

Fire Hazards

An accident which occurred several years ago in the laboratory of a large manufacturer of toilet articles, and which resulted in the death of two men, is an example of the dangers involved in the handling of flammable materials. The chemist and his assistant were carrying out a reaction which involved the use of ether. Both men were familiar with the ordinary course of the reaction, but in this case the belt came off the stirrer, which resulted in local overheating inside the reaction vessel and ether fumes escaped into the room. The chemist had one of his assistants open the windows for better ventilation, and he stepped over and threw a switch controlling the stirring apparatus. This caused a spark which ignited the ether vapour in the room, and the resulting puff blew the man standing at the window through the opening. He was not seriously injured. The fire which followed caused burns to the chemist and the assistant working directly with him which resulted in their death the next day. The laboratory was practically a total loss.

Almost everyone realises the extreme flammability of ether, but a point which is not often realised is that the vapours travel along a surface, as, for example, the laboratory table top, and a spark or flame at some distance from the source of the ether will ignite the mass of vapour. In using ether or similar volatile flammable liquids, no open flame should be allowed on the same table. If the ether is to be boiled or distilled, the heat from an ordinary incandescent bulb is sufficient for the purpose. Of course, electric switches or devices which may cause a spark should not be operated when ether or other volatile flammable liquids are being used near by.

Gases in Cylinders

In using oxygen it should be remembered that oil should be avoided in all valves and lines. Also hydrogen and oxygen should not be used interchangeably with reducing valves or pipe lines. Not only do the two gases form explosive mixtures, but the hydrogen may contain traces of oil which is used in connection with the compression of this gas. Another gas which is coming into use in cylinders is hydrogen sulphide. This can be called one of the primary reagents of the chemical laboratory, and, contrary to the general opinion, it is quite poisonous. Hydrogen sulphide causes irritation of the eyes and respiratory tract, and as little as 0·10 to 0·15 per cent. in the air will cause death in one-half to two minutes. Laboratories should be and generally are now equipped with a hood which is ventilated by strong draught from a suction fan. With such equipment hydrogen sulphide, chlorine, and other poisonous and corrosive gases can be handled in perfect safety. The hood should be used for all reactions in which irritating fumes or smokes are given off.

Dyemakers' Benzol Used by Motorists

In a lecture entitled "Concerning Chemical Conundrums" to members of the West Riding Section of the Society of Dyers and Colourists last week, Dr. E. F. Armstrong said that the chemist was subject to a constant urge because competition ceaselessly caused trade and commerce to find new and profitable outlets for their goods. The time was coming when the by-products of coal would grow so great that for that reason alone an alteration would have to be made. Petroleum was at present wastefully used. All the benzol available was wanted by the Saturday and Sunday motorists, and the dyestuff makers had to take second place; unless, of course, they were prepared to outbid the motorist. There was, therefore, a necessity to find means of making benzol synthetically, or getting much more of it from coal. Referring to synthetic textiles, Dr. Armstrong predicted that tens of thousands of tons would be produced annually before ten years' time, and that new threads would be produced possessing different properties from those in use at present.

Institute of Chemistry Pass List

The pass list for the September examinations of the Institute of Chemistry is as follows:—*Examination in General Chemistry for the Associateship:* Macadam, G. H., B.A. (Cambridge University); Osborn, H. W. L. (Sir John Cass Technical Institute and Northern Polytechnic, London); Smirles, W. N., B.Sc. (Birmingham Central Technical College); Smith, A., B.Sc. (trained under G. E. Johnson, B.Sc., F.I.C., at Hull Municipal Technical College); and Wilson, H. N. (trained under the chief chemist, Sadler and Co., Middlesbrough; and at Darlington Technical College).—*Examinations for the Fellowship: In Branch D: Biochemistry, with special reference to the Hormones:* Fuller, A. T., Ph.D.—*In Branch E: The Chemistry (including Microscopy) of Food and Drugs, and of Water:* Jones, H. H.; Trace, L. H., B.Sc.; and Turner, C. F. —*In Branch G: Industrial Chemistry, with special reference to Petroleum Technology:* Kelly, C. I., M.Sc.Tech.—*Chemical Technology of Textiles:* Jackson, S. R., B.Sc.Tech.—*Special Examination in General Chemistry:* Beaumont, G. W.

The Classification of Fire Risks in Industry

A Practical Review of the Subject

In a lecture on "Fire Risks in Industry," delivered by Mr. A. M. Cameron, B.Sc., F.I.C., before a joint meeting of the Edinburgh local sections of the Institute of Chemistry and the Society of Chemical Industry and now published in pamphlet form by the Institute, the subject of fire risks in industry is dealt with exhaustively, as the following extracts show.

THE causes of fires are so many that it is difficult to make any classification of them. T. H. Gant, in an article contributed to THE CHEMICAL AGE (1920, Volume II, p. 428), enumerates eight causes or groups of causes.

(1) Direct ignition by flame or glowing materials.
(2) Spontaneous heating.
(3) Spontaneous ignition.
(4) Explosion.
(5) Electric sparks or flashes of lightning.
(6) Chemical reactions.
(7) Pressure, friction, shock, concussion.
(8) Focused rays.

Direct Ignition

Perhaps the most obvious predisposing cause of fires is inattention to what the Americans term "good housekeeping." By that term is meant scrupulous attention to tidiness and cleanliness throughout the works. From time to time, particularly in small and obscure works, one comes across shockingly bad examples of such inattention. Inflammable material, scraps, etc., are allowed to be left lying about in heaps, and shavings or oily waste are allowed to accumulate. Of the 262 fires that took place in Edinburgh in 1925 in premises other than dwelling houses, no less than 59 are ascribed to lights thrown down, this being by far the most frequent of all the tabulated causes.

Another point which may be referred to in this connection is the time incidence of the fires. Thus, of the four 6-hour periods of the twenty-four, that between 6 p.m. and midnight showed the greatest number, and of the hourly periods that between 8 and 9 p.m. That is to say, the greatest number of fires occur shortly after premises have been closed for the night, where a fire that may have been started, or is smouldering, at closing time is able to "get away" with no one to observe it.

Spontaneous Combustion

The causes of spontaneous combustion most frequently met with in practice are :—

(1) The heating of vegetable matter due to bacterial action or slow oxidation.

(2) Oxygen absorption by textiles impregnated with drying or semi-drying oils.

(3) Ignition of carbon in a fine state of division.

(4) Storage of incompatible substances.

Generally speaking, a substance liable to spontaneous combustion is one in which oxidation can begin at ordinary temperature, and once initiated, can go on sufficiently rapidly to produce enough heat to raise the temperature of substances to the point of visible combustion before the heat produced can be radiated or conducted away. Fibrous materials are hazardous because of the very large air spaces that they contain relative to their own weight; and piles of textiles a few feet in height will retain heat for hours, with only a very slow drop in temperature. This high air content also accelerates the oxidation of drying oils that have been absorbed by fabrics.

Fibrous matter is a source of hazard when in contact with salts such as permanganates and chlorates, as the friction caused by transit and handling may be sufficient to bring about ignition. Even wood shows this effect, and such salts should be stored in casks lined with smooth paper. Carbon in a fine state of division is a not infrequent source of spontaneous combustion, owing to surface condensation of oxygen. It is not always realised that many organic substances will char at temperatures not much higher than 100° C., or even lower if subjected to the temperature for a prolonged time. Paper and wood are examples.

Storage

Improper storage conditions, and the storage of "incompatible" substances has been the cause of many fires. This is not so often met with in factories as in warehouses and stores, where many different materials are stored, and where those handling them are often ignorant of the fire-risk properties of the materials. Wholesale and manufacturing druggists' premises have provided considerable store hazard, particularly in the case of strong mineral acids. Straw packing is dangerous in contact with nitric acid, and a carboy of nitric acid becoming broken and the acid flowing amongst such material is very liable to cause a spontaneous outbreak of fire. It has been found that straw will ignite within 35 to 45 minutes when in contact with nitric acid of s.g. 1·30 to 1·38, and weaker acid has sometimes been known to cause ignition.

Very stringent regulations have recently been issued as to the carriage of chemicals on passenger ships, and railway companies also have regulations as to the carriage of dangerous goods. While on the question of storage one may mention the desirability of so arranging the goods that water damage is minimised.

Static Electricity

This source of hazard has attracted some attention in recent years. The production of an electrical charge by means of friction between solid surfaces has of course long been known, but it has not been so generally realised that liquids flowing through pipes may also generate current. Donezalek, in Germany, was one of the first to perform quantitative work on the problem. He passed benzol and ether through pipes of different metals at varying speeds by means of carbon dioxide under pressure. Using benzol and copper pipes, he found that at a speed of one metre per second a potential of 1,000 volts was developed on the benzol. At two metres per second the potential was 2,000 volts. The charge in this case was negative. Iron gave a higher potential, also negative, 2,000 volts being reached at 1·3 metres per second, and 3,000 volts at 2·5 metres per second.

As a rule, 500 volts were found to be sufficient to produce a spark of sufficient intensity to ignite a mixture of benzol vapour and air. Charges of opposite sign are produced on the pipe and on the liquid. The pipe can be readily earthed, but it is not so easy to earth the liquid.

The hazard of static electricity has been brought into prominence in the case of tank wagons being filled with petrol. A case that attracted a good deal of attention occurred at the works of Shell-Mex, Ltd., Shellhaven, Essex, on August 28, 1924, when a man and a boy were killed while a road car was being filled with petrol from a pipe line. After eliminating various possible causes, the Home Office Inspectors came to the conclusion that static electricity was the cause. The remedy in cases such as the above is to earth all metal work. This eliminates a large part of the risk, though a charge can still accumulate on the liquid itself, which is more difficult to deal with. This usually, however, tends gradually to discharge itself on to the metal work. Static electricity can be developed by solid friction. Leather or composition belts running over wooden pulleys are not an infrequent cause, and it is sometimes necessary to discharge these by hanging a metal earthed comb in contact with the belts.

Ignition of Inflammable Vapours and Dust

The ignition of inflammable vapours is a very frequent source of fires indeed. This is not surprising when it is considered how many processes make use of volatile liquids. Any process which permits vapour of such liquids to escape into the air must be considered extremely hazardous, and there are far too many such. It is no doubt considered that the cost of installing the necessary plant to prevent such escape or to recover the vapours would not pay for itself in the value of the recovered liquids, but it cannot be gainsaid that to allow such valuable matter to be lost is a shocking waste.

The hazard of explosive and inflammable dust is present in many industries, among which may be mentioned: milling of all kinds of cereal products and oil seeds, sugar, starch, sawmilling, bone-grinding, drug-grinding, etc., to make no mention of coal-dust, which is now coming into prominence with regard to pulverised fuel installations. For an explosion to occur,

it is necessary, first, that the dust be there; and, secondly, that it be projected into the air as a sufficiently fine cloud. The causes of the ignition of air-dust clouds may be summarised as follows:—

(1) Hot gases and naked flames.
(2) Overheated bearings.
(3) Sparks due to some mechanical cause.
(4) Electrical sparks, including that due to static.

Insolation: Exposure to the Rays of the Sun

This is more frequently the cause of fires than is often imagined. Volatile liquids in glass vessels are frequent offenders, and as may be imagined, druggists' shops are very often the venue, owing to the number of glass bottles, often of a large size, in the windows. Fortunately, such fires are most apt to occur during a busy part of the day, and so do not get so much chance of getting away. A case showing how easily a fire may be started was brought to my notice recently. A water bottle in a railway restaurant car focused the rays of the sun on the green baize of a table, and the evidence of the occurrence was smoke rising from the table. Bottle-glass windows have been known to ignite wood-work. It used to be by no means infrequent to find such windows in old factories, such as corn mills, and disastrous explosions have been known to occur from this cause.

Protection Against Fire

There remains the subject of first aid fire protection devices and appliances. One still finds works where scant attention is devoted to this matter, even the humble fire bucket being not always in evidence. Portable extinguishers fall into five main classes:

(1) Soda-acid extinguishers.
(2) CCl_4 extinguishers.
(3) Those containing compressed CO_2.
(4) Foam extinguishers.
(5) Dry-powder extinguishers.

The first is the oldest and its working familiar to most people. It is suitable for dealing with blaze-ups from paper, textiles, wood, etc., but is not so suitable for dealing with oil or varnish fires. One drawback to its use is that the contents have a corrosive effect on paintwork or other easily damaged surfaces. The second, or carbon tetrachloride type, is coming more into use, and is familiar as the usual type of extinguisher carried on motor cars. The charge consists of CCl_4 with usually CO_2 dissolved in it, oil of myrbane (added to impart dielectric properties to it so that it can be used for fires caused by electricity, or where live wiring is exposed), and an ingredient to lower the freezing point. This type of extinguisher is operated by means of a pump resembling a cycle pump, and this is sometimes an advantage.

The third type, the CO_2 pressure type, is not so often seen. In this type, pure water is ejected by the release of CO_2 from a cartridge of the manner of a sparklet bulb. This has the advantage of being entirely non-corrosive, except where $CaCl_2$ is added to the water to prevent freezing. The fourth type, the foam extinguishers, have come greatly into prominence of late years, owing to their suitability for dealing with oil fires. They are made in all sizes, from the small two-gallon extinguishers to the large installations at oil tank farms, where the solutions are stored in large holders and distributed through mains and hydrants from a central pumping station. The fifth type (dry-powder), as compared with the other types, is less used. Dry-powder extinguishers are usually receptacles containing a mixture of bicarbonate of soda and an inert substance such as sand.

By far the most important of all rapid extinguishing devices is that known as the automatic sprinkler system. In this system, pipes connected to the water mains are laid along the ceilings of the premises to be protected. At intervals (usually from 8 to 12 ft.), valves are fitted into the pipes. These are normally closed by the use of metal strips soldered together by means of fusible metal. When the temperature in the vicinity rises to a certain point, the solder fuses, allowing the valve to open, when the water is emitted in the form of a dense shower. One of the best known types is that made by Mather and Platt, of Manchester.

Soaps in Textile Industry

A Paper Before the S.C.I., Nottingham Section

THE Nottingham Section of the Society of Chemical Industry held its first meeting of the session jointly with the Midlands Section of the Society of Dyers and Colourists, on Wednesday, October 19, at University College, Nottingham, Mr. Pentecost in the chair, when a paper was read by Mr. John Allan (Joseph Crossfield, Ltd.) on "Soaps in the Textile Industries." Mr. Allan said that soaps, which as used were essentially the sodium and potassium salts of fatty acids, were made from a very large variety of fatty substances. Yet only a very few fatty acids were concerned with soapmaking. Of these fatty acids some were saturated, the most important of these being lauric, mynstic, palmetic and stearic, whilst the most important unsaturated acids were oleic, linoleic, and linolenic acids.

In soapmaking a detailed knowledge of the properties of the sodium and potassium salts of these acids was desirable. The acids were difficult to obtain in the pure state, particularly those of the unsaturated class, which were liable to undergo change. The sodium soap of lauric acid readily produced a voluminous lather, with large bubbles, but very prone to collapse; as one passed up the series to palmetic and stearic soaps the lather was less voluminous but of closer texture and greater permanency. Thus coconut oil and palm kernel oil soaps gave a voluminous lather. The lecturer pointed out that the lathering properties of a soap could not be taken as a measure of its efficiency, and contrasted the lathering properties of saponins, which were inferior to soap in cleansing power.

Properties of Soaps

The properties of a soap were determined by its constituents, and specific properties might be given to a soap for specific purposes. Some soaps produced slimy lather, which although soluble might be difficult to remove completely from the fibre. Mr. Allan referred to the work of McBain, who attributed the detergent action of the soap to the formation of a colloid aggregate micelle of high ionic mobility. The electrically charged aggregate might facilitate the lossening of the dirt, which was then adsorbed on the micelle. The method of estimating the efficiency of a soap by the lowering of surface tension produced could only be used with limitations.

Soap was used in the textile industry to remove impurities, etc., from raw materials, to remove added fatty matter, to facilitate mechanical treatment, in the dyebath to facilitate dye penetration, and in the finishing of many goods.

Mr. Allan emphasised the importance of the complete removal of the soap from the fabric before storing. Soap left in the fabric ultimately became oxidised; the fabric develops an odour, and might also become stained and damaged. It would appear that oxidation was greatly stimulated by the presence of small amounts of highly unsaturated compounds, which were themselves oxidised first and then functioned catalytically. As an example, he stated that the colouring matter of palm kernel oil was readily oxidised, after which it was capable of inducing oxidation of the fatty substances present. The products of oxidation showed a great tendency to adhere to the fibre. Again, any residual soap might become carbonated by the carbon dioxide in the air, free fatty acid being liberated. Mr. Allan concluded by pointing out the necessity for soft water in operations where soap was used; since the calcium and magnesium salts present in a hard water formed the corresponding calcium and magnesium soaps. These soaps are insoluble, but under the influence of hot water they become plastic, and adhered tenaciously to the fabric. An interesting discussion followed.

Chemical Society Meeting

THE next ordinary scientific meeting of the Chemical Society will be held at Burlington House, Piccadilly, London, on Thursday, November 3, at 8 p.m. The following papers will be read:—"The Complex Salts of Nickel with Various Aliphatic Diamines," by F. G. Mann; "The Mechanism of the Formation of Citric and Oxalic Acids from Sugars by Aspergillus Niger," by T. K. Walker, V. Subramaniam and F. Challenger; "The Complex Cyanides of Molybdenum," by W. R. Bucknall and W. Wardlaw; and "The Parachor and Chemical Constitution. Part VI. Some Cases of Supposed Ring-Chain Tautomerism," by F. B. Garner and S. Sugden.

Survey of German Chemical and Fuel Technology

Position of the Potash Industry

The following extracts, relating to the condition of the chemical, fuel, and potash industries of Germany, are taken from the "Report on Economic and Financial Conditions in Germany to July, 1927," prepared by J. W. F. Thelwall, Commercial Secretary, Berlin, with chapters by C. J. Kavanagh, Commercial Secretary, Berlin, just published by the Department of Overseas Trade. It is obtainable from H.M. Stationery Office at 3s. 6d. (3s. 8d. post free).

In the sphere of industrial technology and research an immense amount of activity is perceptible. A great deal of consideration is being devoted to the hydrogenation of coal and lignite and to the catalytic reactions for the production of fuels and oils from coal, but a strict reticence is maintained on the yields of the process and only in the Bergius and Fischer systems have the general principles of operation been made known. It is said that the process of the Chemical Trust which is engaged on the erection of a commercial plant at Leuna to synthesise liquid fuels from brown coal is the one holding out an early promise of commercial success.

The I.G. Process

The only important announcement which the Chemical Trust has made is that its present process is not to be identified with the previous patents on the catalysis of carbon monoxide and hydrogen under pressure, but that they have adopted a different and more promising line of experiment. This process is believed to be one combining the hydrogenation of brown coal with catalytic treatment at determined periods of the hydrogenation process under varying conditions of temperature, pressure and velocity to secure definite end products. For this method a greater elasticity of manipulation is claimed leading to the production of low flash point hydrocarbons of the aliphatic and aromatic series. Inasmuch as the I.G. process touches upon the fundamental work of Bergius, they have acquired the right of these patents for lignite and by their participations in the Kobergin A.G. have established their position also in respect to coal. The Chemical Trust, as is well known, have in recent years resorted to the distillation of brown coal for the water gas basis of the synthetic ammonia process in preference to their previous method which operated upon coke. The combination therefore of the Bergius process applied to brown coal with the cheap hydrogen production from the same raw material, was undoubtedly a factor which influenced this line of approach to the problem of synthetic fuels, especially in relation to the costs of production of hydrogen. Simultaneously with the Bergius and I.G. processes, Fischer and Tropsch are also engaged on a line of investigation of their own, and a 30 ton experimental plant for the hydrogenation of coal is being installed by the A.G. für Kohlenverwestung in Duisburg.

While the production of liquid fuels direct from coal is the subject of careful research, motor fuels have in addition been produced by the hydrogenation of crude tars from low temperature distillation plants.

Coal and Chemical Research

The coal industry has formed an investigation company to undertake research in fuel technology, and concurrently the field for the economic utilisation of coal is being investigated from the point of view of low temperature carbonisation and the supply and long distance transmission of domestic gas direct from the coke ovens. The possibilities of correlating the production of gas and tars from low and high temperature distillation plants with the utilisation of the resulting coke and coke oven gases for the hydrogen basis of synthetic ammonia and synthetic fuel production, is receiving consideration in the hope that some such closer association of the coal mining and chemical industries will lead to a more rational exploitation of the coal supplies. So far synthetic ammonia production has been initiated at the Mont Cenis mine, where the coke oven gases are prepared by the Bronn-Linde process, and delivered sufficiently pure for catalytic treatment according to the Casale or Mont Cenis method.

These fields of investigation are, however, only in their early stages, but this knitting together of coal and chemical research is one which is regarded as of considerable importance for the future.

The General Chemical Industry

The chemical industry is, by reason of the extreme complexity of its products, a difficult subject for general review. The gains and losses in various branches of chemical enterprise have little interest unless correlated with the advances of chemical technology over a very wide field, and there are obvious limitations to an inquiry of this nature, especially in view of the paucity of statistical material. Any useful comparison with pre-war standards is, moreover, difficult, and might be misleading owing to the change of the centre of gravity of chemical production from fine organic chemicals to artificial fertilisers and from the displacement of the natural product by the synthetic one. The production of sulphuric acid, for instance, has decreased from 2,700,000 tons in 1913 to 1,800,000 tons in 1925, in part due to post-war territorial losses. Synthetic fertilisers have, on the other hand, shown a large increase and have risen from some 120,000 tons to over 450,000 tons in terms of pure nitrogen. Superphosphates have also shown a very considerable fall, and coal tar dyes have suffered by the increased production abroad.

The most important phase of development lies rather in the trend of research and the investigations into new ballast-free and compound fertilisers, synthetic fuel production as already mentioned, and the interweaving of chemical processes so that the surplus products of reaction from one process might be harnessed to another. The success achieved in the synthesis of methyl and butyl alcohols has naturally attracted a great deal of attention and stimulated further research into the nature of catalytic reactions and the structure and composition of catalysts. Whilst the temperature and pressure requirements for synthetic processes on a commercial scale are being very closely studied, research is being extended to the sphere of reaction accelerators, such as the electric field and electric discharge, in the hope of defining more closely the conditions necessary for the fractionisation of hydrocarbons.

German Leadership

The German industry is very fortunate in having at its head men of exceptional vision and men with wide experience of applied chemical science who are able to formulate definite lines of investigation and correlate the observations made over a very wide field of research to the solution of new problems. Germany has gone a very long way in utilising to the full the chemical talent which her technical colleges and universities have provided, grading the research workers according to their particular qualifications and in allocating to them work for which their particular talent in chemical technology fits them. The visionary experimentalist, the exact observer, and the chemical engineer have each allotted to them a sphere of work destined to make best use of individual capacities. It is along the lines of repeated experiment and observation that the chemical industry has laid the foundations of its future achievements, and it is chiefly to the excellent combination of its directive policy and the patient research of its chemists that its success is largely due.

The great German Chemical Trust naturally occupies a foremost position in the industry and, though it has had to face important losses of markets in the dye trade, it has developed itself in other fields, notably in synthetic nitrogen and combined fertilisers, synthetic hydrocarbons, resins and perfumes, and in pharmaceutical products. The recent amalgamations formed with the explosive manufacturers and its interests in artificial silk have all contributed to an alteration of its structure. Every effort is now being made to consolidate itself into a perfectly balanced unit by the elim nation of duplication in the manufacturing processes of its constituent members. The initial success which it achieved in artificial nitrate has greatly strengthened its position and it can look back with gratification upon its pioneer work in this field, which has done so much to retrieve its position from a financial and technical standpoint.

Reports have been current of the possibilities of an international co-operation in the sphere of chemical enterprise; a review of recent developments in chemical technology and the

possibilities of collaboration in a sphere requiring so much diligent and synchronised research suggests that joint efforts might well be of mutual benefit.

Potash Sales and Prices

Although in 1926 the very favourable results achieved in 1925 were not attained and sales showed a diminution of some 125,500 tons, with 1,100,000 tons they far exceeded 1924 sales, which amounted to 843,860 tons. Moreover, in view of the favourable development in the first quarter of this year, it would appear that the results of the fertiliser year, May, 1926, to April, 1927, will be even more satisfactory than in the previous year. It is true that German inland sales, which account for nearly 60 per cent. of production, showed a reduction in 1926, but this would seem to be counterbalanced by increased sales during the first quarter of this year, which are largely attributable to the mild weather. For the eleven months, May, 1926, to March, 1927, total sales amounted to some 1,160,000 tons, as against 1,070,000 tons in the corresponding period in the previous year. Foreign sales did not develop to the extent which had been hoped, but were doubtless in some measure temporarily influenced by the change in the foreign sales organisation consequent upon the conclusion of the Franco-German Potash Agreement. Foreign sales are now undertaken conjointly by the German Potash Syndicate and the Société Commerciale des Potasses d'Alsace.

The provisional Franco-German Potash Agreement, which was concluded up to April 30, 1926, was, as a result of a meeting on April 10, 1926, in Lugano, converted into a long-dated agreement which has since been signed in Paris. The new agreement is fixed for a period of 10 years with effect as from May 1, 1926, with the proviso that it can be terminated at the end of 1932 after a previous year's notice has been given. Otherwise the agreement remains in force for the full 10 years and will automatically be prolonged for a further five years if no notice is given one year in advance. Sales outside of Germany and France, including her colonies and protectorates, will be divided between Germany and France in the proportion of 70 to 30, but, should the total exports exceed 840,000 tons per annum (in 1925 the total exports of both countries amounted to some 640,000 tons of pure potash), exports above this amount will then be divided in the proportion of 50 to 50. Should total exports in the first five years, however, not reach 840,000 tons per annum, at the beginning of 1931 a participation proportion of 50 to 50 will be applied to exports in excess of the previous highest combined exports of the two countries.

Alsatian Potash

Alsatian potash sales have undergone a considerable increase which is, however, largely to be ascribed to the depreciated currency. At the present time there are in Alsace 15 shafts with six potassium chloride factories. From the other European supplies Germany feels she has little to fear. The reported developments in potash productions in the Transvaal, Texas, Mexico, Colorado, Utah, India, and Russia have in German informed circles been received with considerable scepticism.

In the last annual report it was mentioned that the potash industry had applied for an increase in prices and that the Government had formed a committee to investigate conditions before sanctioning such a measure. The results led to the Government agreeing to an increase in prices which amounted to an average of some 9½ per cent. and came into force on December 23, 1926. The prices for potassium chloride and salts containing sulphuric acid were not increased and are still some 10 per cent. below pre-war prices. The increases for certain other salts are as follows :—kainit 20·7 per cent., 20 per cent. fertilising salts 24·2 per cent., 40 per cent. fertilising salts 13·2 per cent.

Of the by-products salt again took the most important position and production amounted to some 1·6 million tons. The bromine and magnesium chloride syndicate which expired in 1926 was after long and difficult negotiations extended for a further two years.

Mixed Fertilisers

The outstanding development in mixed fertilisers has been made by the Dye Trust, which has recently marketed under the name "Nitrophoska I.G.," a fertiliser with a potash content of from 21·1 to 25·6 per cent., 14·7 to 17 per cent. nitrogen and 10·2 to 11·7 per cent. phosphoric acid. It is too early yet to predict the success which this new fertiliser will meet, but in expert circles a good deal of confidence is placed in it and, in view of its high content, it is hoped that it will lead to a higher potash consumption and may eventually result in a closer connection between the Potash Syndicate and the Dye Trust.

Of other developments in the sphere of mixed fertilisers may be mentioned the project of the Klockner Works to erect, in conjunction with the Wintershall concern, a mixed fertiliser plant at Rauxel and Sondershausen. In the first instance, however, the plant will be of an experimental nature, and, even should the result prove satisfactory, some time must elapse before production is begun on a large scale.

For the first time since the war, the industry is in a position to pay dividends, a result almost wholly attributable to the foreign loan. The potash harbour which is under construction at Hamburg is being financed by the Prussian State. Generally speaking, the rationalisation period in the German potash industry can now be looked upon as being at an end.

Chemical Industry Club

Improved Financial Position

THE report of the executive committee of the Chemical Industry Club for the past year states that the position of the Club remains essentially as it was in 1926; on August 31 there were 722 members, as compared with 726 the year before. Thirty-nine new members were elected, but losses due to resignations and other causes amounted to 43; no fewer than nine losses through death were incurred during the year. On September 1, 1927, the membership comprised 414 town members, 240 country members, and 60 overseas members. For some time past the committee has been considering means of obtaining the support of a number of influential members of the chemical profession and industry who have remained outside the fold; and with this end in view it is now taking definite steps to bring the merits of the Club to their notice. The annual dinner held in November in association with the leading chemical societies was attended by about 430, and established a record, and the gathering was a great social success. Monthly meetings were held, as usual, in the winter session, at which Mr. C. S. Garland spoke on "The Incandescent Gas-Mantle Industry"; Dr. J. C. Smithells on "The Preparation of the Tungsten Filament"; Lt.-Col. C. H. S. Evans on "Scientific Aspects of Anti-Aircraft Searchlight Work"; Mr. C. Ainsworth Mitchell on "Expert Evidence in Criminal Trials"; and Mr. L. Bellingham on "Optical Instrument-Making: Some of its Difficulties."

Professor F. G. Donnan, F.R.S., has been nominated president of the Club for a second year, Dr. F. B. Dehn chairman of the executive committee, Dr. E. H. Tripp hon. secretary, and Mr. T. Miller Jones hon. treasurer. Those members will be proposed for election at the annual meeting to be held on October 31, together with those yet to be nominated to fill the five vacancies on the committee.

The committee expresses its thanks to Dr. W. R. Ormandy, the retiring chairman, for his excellent services during the past two years; to Mr. J. Arthur Williams for his continued devotion to the interests of the Club; and to the steward and his staff for their unfailing courtesy and attention. The Servants' Christmas Fund realised the sum of £166 5s.

Financially, the position of the Club is better than it was a year ago; receipts are slightly lower, but owing to the institution of various economies, which have in no way affected the comfort or convenience of members, and to the absence of a deficit on the annual dinner, expenditure has fallen to a greater extent. The committee looks forward with confidence to the future prosperity of the Club.

The financial statement shows a surplus balance, to be carried forward, of £86 5s. 10d., as compared with £8 1s. 3d. the previous year.

An Attractive Advertising Brochure

As a guide to the selection of an advertising agency, the new brochure issued by Frederick E. Potter, Ltd., Imperial House, Kingsway, London, will no doubt be of great assistance to firms considering a publicity campaign. Its title "For Success in Advertising" is well supported by a series of advertisements of familiar articles reproduced in the brochure, several of them the products of well known chemical, rubber, and like manufacturers. We understand that the brochure will be sent to heads of businesses upon application.

The De Vecchis Process

Report of Dr. B. J. Owen's Investigations

The report of Dr. B. J. Owen, Director of the Institute of Agricultural Engineering, Oxford, on his investigation of the De Vecchis desiccation process for the production of sugar from beet has now been published by H.M. Stationery Office for the Ministry of Agriculture and Fisheries, under the title of "A Report on An Investigation Into the Desiccation of Sugar Beet and the Extraction of Sugar, with a note on the Treatment of Sugar Beet Effluents" (pp. 84, 2s. 6d.).

THE report now published is a continuation and expansion of the progress report on the De Vecchis process published in 1926. The principal matters to be investigated by Dr. Owen were the conditions governing the drying of sugar beet and the influence of different air temperatures and volumes upon the formation of invert sugar and caramel and the effect upon albuminous substances and other non-sugars; the conditions governing the extraction of sugar from dried sugar beet; and the relation of the several processes to the quality of the sugar.

Conclusions

The report discusses every aspect of the process in detail, giving figures obtained by the investigator. In his summary of the conclusions arrived at, Dr. Owen states that there is no doubt that means have been devised for drying beet which will not lead to inversion or to the formation of caramel. The system of drying previously tested at the Oxford Institute was successfully employed. No confirmation could be obtained of the hypothesis that a two-stage drying process is necessary for the drying of beet. The experimental work appears to show conclusively that the same effects of coagulating the albuminoids present can be produced by a one-stage process. In practice this result is obtained by drying in the mass, the effect of which is to give a uniformly dried product throughout, whilst controlling the chemical changes which occur through the application of heat to protect the sugar. The conclusion reached by De Vecchis, Lafeuille, and others on the coagulation of the albuminoids in beet through the application of heat was confirmed.

The method of purification by means of lime and superphosphate, as used by De Vecchis, gave rise to difficulties in filtration. The method finally adopted consisted of mechanically clarifying the juices either before or after liming, whichever is the more convenient. Another method, which also produced a white sugar, consisted in using, after liming, an activated carbon. The investigation resulted in producing a new sequence of operations and also new individual steps. The cost of the process has been examined, and the results indicate prima facie that it has many economies worthy of the attention of the sugar industry.

Treatment of Effluents

As regards the question of the treatment of effluents from beet sugar factories, Dr. Owen points out in an appendix that although in the desiccation process of beet sugar manufacture the amount of effluent is reduced considerably, as compared with other processes, it is still a potential source of trouble. Various methods of solving the effluent problem having been considered, it was finally concluded that the best means available was efficient screening and filtration. The plant used in the investigation was a Brackett two-stage cup-type screen and a Pennell-Wyllie filter, lent by F. W. Brackett and Co., of Colchester. The screen was of a type usually employed in the screening of waters, where as much as possible of the suspended matter, both large and small, is to be removed. From the sump beneath the screen the effluent was pumped to the Pennell-Wyllie filter.

From the trials carried out with this type of apparatus upon the effluents available, uniformly successful results were obtained. The filter produced good results, and the problem of dealing with conveying and washing waters seems capable of easy solution by this method, as they can either be discharged direct to the river or recirculated. The process effluents, mainly from the diffusion battery and the pulp presses, present a rather more difficult problem. It is probable that these also can be purified by the excess lime method in the Pennell-Wyllie filter.

One practical method of dealing with the whole effluent from a diffusion factory presents itself. The whole plant, settling tank, scrubbers and strainers must be designed on a scale to treat the whole effluent from the factory so as to be able to pass it all into the river without recirculating. But the necessary valves, etc., for recirculating, must also be provided so that either recirculating or direct discharge may be used as desired. In the case of a desiccation factory the system may be regarded as an efficient means of treating the whole of the waste waters.

Food and Drugs Acts

Ministry of Health Report for 1926-27

A PAMPHLET on the Sale of Foods and Drugs Acts, being *Extracts from the Annual Report of the Ministry of Health for 1926–27, and Abstract of Reports of Public Analysts for the year* 1926, has been published (H.M. Stationery Office, 1s. 6d.). During the year 1926, thirty-nine appointments of public analysts in England were approved. The total number of samples analysed during the year was 120,617. This was the largest number ever recorded, and exceeded the previous largest number (1925) by 1,677. 7,044 samples, or 5·8 per cent. of the whole, were regarded as adulterated or not up to standard, as compared with 6·5 and 5·9 per cent. in 1925 and 1924 respectively. The statement of the results of analysis of certain articles under the Sale of Food and Drugs Acts during 1926, and comparison of percentage adulterated with that in 1925 is as follows:—

	Number of Samples.		Percentage Adulterated.	
	Examined.	Found Adulterated or not up to standard.	1926.	1925.
Bread	280	1	0·3	0·7
Butter	11,478	175	1·5	1·5
Cheese	1,462	31	2·1	4·4
Cocoa	1,283	3	0·2	—
Coffee	1,709	7	0·4	0·8
Confectionery and Jam	1,674	38	2·3	6·5
Cream and Preserved Cream	2,276	253	11·1	013·1
Flour	609	8	1·3	1·5
Self-Raising Flour	790	5	0·6	0·4
Margarine	3,268	47	1·4	0·7
Milk	62,507	4,625	7·4	8·3
Condensed Milk	1,097	20	1·9	2·1
Mustard	682	31	4·5	4·1
Sugar	767	3	0·4	0·4
Tea	831	14	1·7	0·6
Vinegar	1,782	111	6·2	6·8
Wine	105	4	3·8	2·4
Beer	487	—	—	2·3
Spirits	2,258	291	12·9	13·8
Drugs	5,287	236	4·5	5·4
Other Articles	19,985	1,141	5·7	5·6
All articles	120,617	7,044	5·8	6·5

A case was reported of the use in chocolate rock of commercial burnt sienna containing an excessive quantity of arsenic. The analyst reported that the article so prepared was unfit for consumption, and the manufacturers undertook to discontinue the use of the arsenical colouring matter and to withdraw the material from stock. The presence of minute quantities of lead and traces of copper was responsible in most cases for the adverse reports upon samples of aerated waters. A few samples of tea were reported as containing iron filings. In one case the consignment was seized and destroyed; in a second a fine of £30 and costs was imposed; in another case the vendors were fined £5 for selling tea which contained eight grains of iron filings per pound and 12 per cent. of dust; and a fine of £5 and £2 2s. costs was imposed in a case in which tea dust containing 8 per cent. of mineral matter was sold.

Ernest Benn, Ltd.

SIR ERNEST BENN is in future to act as managing director as well as chairman of the publishing firm of Ernest Benn, Ltd. (who publish many scientific and technical as well as other books); the new deputy chairman of the company is Mr. Gordon Robbins, formerly of *The Times*.

Chemical Developments of the Future

Sir Alfred Mond's Forecast

A SURVEY of the rise and existing ramifications of the chemical industry, and a prediction of its future in relation to industry and to civil life generally, was given in an address by Sir Alfred Mond which was read by Dr. F. A. Freeth at a meeting of the Central Economic League on October 20 at Caxton Hall, Westminster.

Industry, he said, was becoming always more interdependent, and many of the basic industries of this country had to rely more and more on the chemical industry for essential raw materials. When Imperial Chemical Industries, Ltd., was formed, it was felt that, successful as the individual companies had been, in order to secure the supremacy of the British chemical industry it should form one indivisible whole. The alkali trade, which was merely one branch of the chemical industry, could fairly claim to be dealing with the raw material of raw materials. There was a very close connection in the chemical industry between the processes which made the country prosperous in peace and efficient in war. Consider fertilisers and explosives. The same compound which dealt destruction was also a valuable plant food.

The fertiliser industry, as far as this country was concerned, was a comparatively new one, and was intimately connected with the future of agriculture. The initiation of this industry had been a brilliant feat of engineering. Experience gained in the use of high pressure processes used in fertiliser production had afforded a means of attacking new problems in similar regions, and the synthetic production of methanol had been one of the results. The range of dyes made in this country would challenge comparison with those of any other country. The old reproach that the manufacturers of this country were indifferent to research was a thing of the past.

While he would hesitate to predict that this country would ever be independent of outside supplies of food it might be asserted that the chemical industry would put us in a position of reasonable independence with regard to any essential commodities, and in this connection he referred to the new system of grassland management. Turning to another branch of the food question, he pointed out that, though wholesome, artificial fats did not contain the essential ingredients for health, the chemical industry was now in sight of artificial vitamines. Great developments might be expected in connection with fuel, and should there be any scarcity of timber the chemical industry would come to the rescue with a cellulose substitute. It might be predicted that advances would be made on biochemical lines, while the clothing industry would probably fall further into the hands of the chemical industry. We might, therefore, look forward with confidence to a future for man in which his needs were so obviously met by the chemical industry that he would recognise it as one of the dominant factors of his existence.

Imperial Research on Fertilisers

THE delegates attending the Imperial Conference on Agricultural Research were on Wednesday the guests of Sir Alfred Mond at a luncheon at the Savoy Hotel.

Proposing the toast of "The Conference," Sir Alfred Mond said that the position of agriculture in the world was slowly being recognised. He was glad to think that Imperial Chemical Industries, through its subsidiary operating company Nitram, was setting out to render new and increasing services to Imperial agriculture. He referred to the trials of fertilisers which were being carried out in various countries in co-operation with Government Departments, private growers, and commercial corporations, and said they were prepared to help, not merely with their knowledge, but also with their finances. It was a vast and important programme, and it would take a considerable time to work out. They hoped to be able to help a good deal by the use of a staff of researchers, economists, and agricultural experts, who, by their knowledge, not of one problem but of problems all over the Empire, would be able to give advice and assistance.

Lord Bledisloe, in reply, said that the farmer was not always an enthusiastic advocate of agricultural science, and yet there was probably no practitioner in the world who had to a greater extent profited from the results of scientific research.

New Edition of Thorpe's Dictionary

Completion of Publication

WITH the publication of the seventh and last volume (pp. 765, 60s.), Longmans, Green and Co. have completed the publication of the new edition of *A Dictionary of Applied Chemistry*. The present volume deals with headings in the range "Thalenite–Z," and contains an important addition in the form of an index to the complete work, compiled by Dr. Frances M. G. Micklethwait, and covering 155 pages. This was lacking in the last edition, and chemists will be grateful for its inclusion. The publishers are to be congratulated on having brought their undertaking to a successful close, in view of the difficulties which confront those engaged in keeping such works up to date. The revision has been carried out conscientiously. For example, the articles on triphenylmethane colouring matters, tryptophane, tung oil, urea, and vat dyes (to choose a few titles taken at random from many others) have been considerably expanded; while the article on water has grown from 52 to 94 pages.

A sidelight on the difficulties attendant on the preparation of the new edition is to be obtained by perusal of the article under the heading "Thyroid Gland," which also deals with thyroxin. This article stands over the significant initials "G. B."; yet the references to the structure of thyroxin are restricted to the work of E. C. Kendall, and do not touch on the later work of Harington and Barger. This instance is peculiarly striking, for here it is clear that, although the writing of the article was in the best possible hands, the combined difficulties of time, printing and publication proved insuperable. It must be added that this should not be regarded as a criticism of the work, in the preparation of which the publishers have done all that was humanly possible.

A Brilliant Little Book on "Trade"

IT requires a touch of genius to invest a little book of 80 pages on "Trade" with the glamour and fascination that Sir Ernest Benn manages to put into so much that he writes about business and economics. Among the many brilliant numbers of "Benn's Sixpenny Library," one of the greatest achievements of modern publishing, *Trade*—by Ernest J. P. Benn—takes a high place. It is not a heavy, ponderous essay; it is light, breezy, arresting. The reader starts with some chapter on what looks a side issue or detail, and suddenly finds that, in being told all about pins, feather pillows, tablecloths, typewriters, and a hundred other things, he has unconsciously been made to understand the whole fundamental theory and purpose of trade. The author, as he confesses, dodges about from one subject to another, yet always keeping the reader's attention, and teaching him some very sound doctrine all quite unawares. Those who have read *The Confessions of a Capitalist* will know what to expect. The best commendation is to say that they need fear no disappointment.

I.C.I. and Chemical Workers' Union Confer

THE new labour programme of Imperial Chemical Industries, Ltd., recently outlined by Sir Alfred Mond, formed the subject of a conference in London on Monday between representatives of the National Union of Drug and Chemical Workers and the chief labour adviser of I.C.I. This was the first approach by a union on the lines of the new programme of the combine. The union applied for the setting up of machinery to deal with the questions raised by members employed at various works of I.C.I. in London and the provinces. When the conference ended, Mr. Gillian, secretary of the Union, made the following statement to a Press representative:—

"The union applied for facilities to be granted to the organisation to meet the labour managers of the different factories, as has hitherto been done. Mr. Lloyd Roberts (representing the labour departments of Imperial Chemical Industries) was not in a position to guarantee these facilities, except at the decision of the central labour board.

"It was agreed that the secretary of the union should draw up a set of questions to define the applications and obtain the reply of I.C.I. on questions of policy. These questions will be sent in this week and the board will meet to consider them, probably next week."

State Subsidies and Guarantees: Collieries and Railroads

To the Editor of THE CHEMICAL AGE.

SIR,—The statistical return made by the Mines Department, relating to the first quarter of this year, shows that the crisis in our coal industry is pursuing the course which I foretold two years ago. During the period of Governmental interference with both our colliery and our railway industries, our political leaders violated every known law of economics, and, by disjointed and arbitrary legislation, applied to railways a scheme which might have been applied to collieries, and to collieries schemes so ridiculous as to be almost beyond criticism.

When the future profits of our railroads were fixed by statute at the average gross profits earned in a certain pre-war year, there was no logical reason why the average future profits of our collieries should not have been guaranteed in like manner. All such schemes are rotten to the core, and consist in regarding a growing and changing world as though it had reached a static condition, and in relieving private or corporate enterprise from the risks inseparable from industrial and commercial undertakings by turning their security into classes of securities which are wholly or partly gilt-edged. To this extent the capital value of industrial undertakings, now virtually transformed in great part into perpetual preference securities, gains an increase in value. But such increased value can only be obtained at the cost of the State, the consumers, or the public generally, who are left to make good deficiencies, or to pay higher prices for their purchases and for their conveyance. In other words, the risk of loss must be shouldered by the taxpayer, and to that extent he has unwittingly become a guarantor for the scheme, and has mortgaged his chances of making a living by becoming part guarantor against risks of loss which had previously been borne by an industrial undertaking.

Notwithstanding this fundamental defect, some such scheme might have been applied to our collieries. I pointed out at the time that a guaranteed average profit to the owners of 1s. 6d. per ton sold would have been less costly to the State than was an average subsidy of 1s. 9d. per ton. Moreover, it would have carried at least one great benefit with it, in that fresh capital for new colliery enterprise could have been raised on easy terms. But the Government subsidy did not carry this benefit with it, as it guaranteed no profit to those sinking fresh capital in the industry. In fact, the Government have had to lend money to enable colliery enterprise to be carried out in Kent. A guaranteed average profit of 1s. 6d. per ton would also have enabled an industry of national importance—*i.e.*, the Scottish shale-oil industry—to be carried on, and would have thus secured for us every year sixty million gallons of crude oil produced at home.*But the scheme did not secure the approval of some important coal owners, who had in times past handled a bigger profit on their sales and hoped to do so again. How vain their hopes were, has been disclosed by the last returns of the Department of Mines, which shows that, in the first quarter of 1927, the 58 million tons sold resulted in an average profit of under 1s. 2½d. per ton.

During this period, coal was commanding very high prices, there was an acute shortage, and an insistent demand from all quarters. If, under these conditions, an average profit of 1s. 6d. per ton could not be obtained, it is never likely to be exceeded unless the economic conditions of coal-mining in Britain are radically altered.

The figures also prove the damage done to the industry by the reduction in the hours of work decreed by the Government following on the Sankey Commission Report. No sooner were the collieries allowed to work shifts exceeding seven hours than the tonnage raised per man-shift rose by an average of nearly 2¼ cwts., the net wages costs of production fell by 1s. 2d. per ton sold, and the average earnings per man-shift rose 2½d. It is interesting to note that this 1s. 2d. per ton, gained by reduced net wages-cost per ton raised, presents practically the whole profit earned during the period der review.

Since the period under review, the price of coals, and especially of industrial coals, has fallen, profits are diminishing or vanishing, and many collieries have closed down. But the burden of uneconomic taxation, both imperial and local, is still hung round the necks of all classes engaged in the industry, and year by year fresh restrictions further restrain their endeavours to conduct their business profitably. It must be brought home to the Government that it is legislation which has been responsible for crippling these industries, and that it is necessary to abrogate those Acts which press most heavily upon industry.—Yours, etc.,

Isleworth, A. WORSLEY.
October, 1927.

* "A Review of the British Shale Oil Industry," THE CHEMICAL AGE, February 27, 1926.

Film Fire Verdict

Question of Using Non-Inflammable Film

A VERDICT of accidental death was returned on Monday at the resumed inquest on the five victims of the recent fire at the premises of Film Waste Products, Ltd., Union Wharf, Redhill Street, London. The foreman of the jury added that the jury found that the cause of the fire was the overheating of the drying pan, which ignited the celluloid inside, and that a firm dealing with such dangerous material should have stricter supervision and be visited more frequently by the factory inspector. Sir Walter Schroder, the coroner, in summing up, referred to the evidence that factories were visited at least once a year. The evidence illustrated the need of greater supervision in this class of factory.

Mr. E. L. Macklin, engineering inspector of factories, recalled, said that when giving evidence previously, he had stated in cross-examination by Mr. C. G. L. Du Cann, who appeared for Film Waste Products, that the inspector could have taken steps to prevent the use of the dryer by applying to the Court for an order under Section 17 of the Factory Act. "I am now instructed that the official view is that this section could not have been used in a case of this sort, so that no legal action could have been taken to prevent the use of this dryer." Asked by the coroner if there were such a thing as non-inflammable film, he replied, "There are several non-inflammable films now on the market which are pictorially quite as good as celluloid. In France from January 1 next, no celluloid film may be used unless made from this so-called 'non-flam' film."

Lubricating Oil and Grease Federation Meeting

THE annual meeting of the National Lubricating Oil and Grease Federation was held at the Langham Hotel, London, on Wednesday, October 19, Mr. H. Bell Thompson (president) in the chair. The president stated that interest in the Federation had been well maintained. He announced that arrangements had been made with Mr. Harold Moore, consulting and analytical chemist, to act as consultant chemist to the Association. Mr. Moore will also represent the Federation on the British Engineering Standards Association or in any public official inquiries in connection with lubricants, and will keep the Federation posted on any matters of interest to the members. The council was proposing to inaugurate a trade information bureau. Mr. James Todd was elected president for 1927-28 and Mr. W. H. Howe vice-president. The annual dinner was held at the Langham Hotel in the evening, the retiring president being in the chair. Among those present were Sir Arthur Duckham and Sir Robert Waley Cohen.

Colloid Chemistry of Rubber

THE Gow lectures on "The Colloid Chemistry of Rubber," to be delivered by Dr. E. A. Hauser (of Frankfort-on-Main) at University College, Gower Street, London, on November 7, 9, 11, 14, 16, and 18, will deal respectively with the following aspects of the subject: (1) Historical introduction, rubber latex and its colloidal chemistry; (2) Tapping of latex, its coagulation, evaporation, concentration, and preservation; (3) Structure of rubber, Joule effect, density, racking of rubber; (4) Processes of mastication, calendering, dissolution of crude rubber, and the preparation of rubber mixes with special reference to the problem of compounding ingredients; (5) Problem of vulcanisation; (6) Future prospects, the synthesis of rubber, special problems from the point of view of the plantation and rubber manufacturing industry. At the first lecture the chair will be taken by Professor F. G. Donnan, F.R.S. Admission to the lectures is free, without ticket.

Progress of American Chemical Industry

New Products at New York Exposition

ONE of the most remarkable achievements in the history of industry (writes a New York chemical correspondent) has just been completed with the close of the eleventh Exposition of Chemical Industries in New York City, where probably the greatest collection of the various chemical and allied industries in the history of the Exposition were assembled.

The Udylite Co. exhibit of cadmium plating showed a metal resistant to sulphur fumes. The Matheson Co. exhibited ethylene and other liquefied gases, and the distinctive feature of their exhibit was the demonstration of ethylene gas in hastening the ripening of colours on fruit. The American-British Chemical Supplies Co. showed a new plastic material produced from acetyl cellulose, and, for the first time, a large number of samples of fatty acids, waxes, glycerol, and products made therefrom were shown.

Growing Industry of By-products

Many new and outstanding developments in various by-products were exhibited. One of the most comprehensive displays of this nature was by the Ford Motor Co. By-Products Division. The model of the wood distillation plant created much favourable comment because of the detail in which it was constructed and the number of by-products produced. A series of wood distillation products was displayed by the Cleveland Cliffs Iron Co. The Commercial Solvents Co. exhibited synthetic methanol (heretofore a product essentially obtained from wood distillation), which they have succeeded in making synthetically, and this was considered one of the outstanding materials developed in the United States. Among new machinery exhibits were a cantilever filter by the United Filter Co. and an interior filter shown for the first time by the Dorr Co., both of which are of great importance in the filtration field. The drying machinery opened up many new developments, among which were the exhibits by the Gordon Davis Engineering Co. and the James Hunter Machine Co.

Crushing and Screening Plant

The strides taken in the development of machinery used in handling metalliferous ores were noted. Among the crushers were the Hardinge Co.'s conical ball mill and a type of rod mill which are adaptable to an enormous range of uses in general industry. The Abbe Engineering Co., well-known in the ball mill grinding field, had a fine exhibit. The Bethlehem Steel Co.'s pulveriser, which dates back beyond any metallurgical operation in Chile, is a revival of the Chilean mill and its principal features are the revival of the skilled workmanship of the rolls and the methods of handling the raw materials. The various screening processes by the W. S. Tyler Co., Niagara Concrete Mixer Co., Norwood Engineering Co., Orville Simpson Co., C. W. Hunt and Co., and the Traylor Vibrator Co. created much favourable comment and are of great importance in the chemical and mining industries. The exhibit by the Western Precipitation Co. of the Cottrell system of air cleaning by electrical precipitation was one of the greatest of its kind.

A New Monel Metal Tank

In the Container Section, the Pressed Steel Tank Co. exhibited for the first time a Monel metal tank used for the transportation of nitric acid. This was considered one of the most interesting and useful exhibits in the show. The Wheeling Corrugated Steel Co.'s new corrugated drum and barrel, which they manufactured on the premises, secured very favourable consideration from representatives of the industry. The Carpenter Container Co. with its new barrel and drum attracted many interested visitors during the week.

New Chlorine Soda Process

The new Vorce cell shown by the Electro-Chemical Engineering and Supply Co., which is an entirely new process for making chlorine soda, was one of the greatest features of the Exposition and was shown for the first time, creating much favourable comment by engineering authorities and visitors. Among the oldest manufacturers of silver salts in the United States, who exhibited for the first time, was the firm of Phillips and Jacobs, along with the Standard Calorimeter Co., showing Parr calorimeters. Bausch and Lomb Optical Co. showed a number of new optical instruments for the first time, developing a great deal of interest among the visitors from the chemical industry. The General Electric Co.'s hydrogen welding process, using an electric spark as the heating element for hydrogen welding, attracted much favourable comment. Another exhibit of great interest was that of Vitaglass, which transmits actinic or ultra-violet rays. Miner Laboratories' display of furfural and its derivatives and by-products with a new development for electrolytic engraving was of interest.

Various exhibits in the Southern Section by the Southern Railway Co., The Alabama, Birmingham, and Coast Railway, and the Southern Pacific Lines contained exhibits of raw materials useful in the chemical industries throughout the country. The Canadian Section and the Ontario Department of Mines covered a wide range of products and raw materials that were decidedly interesting and well displayed. The various metals and their treatments were among the prominent features and illustrated many interesting developments. The various casein exhibits, along with the synthetic resins, proved interesting and instructive in one of the largest and most diversified exhibits of the kind displayed.

The Government's exhibits were probably the finest ever sent to any Exposition, and contained some extremely valuable data in the fertiliser sections and nitrate division. The exhibits of instruments of precision showed some of the latest processes and practices as used in the chemical industries.

The Twelfth Exposition of Chemical Industries will be held at the Grand Central Palace, New York, during the week beginning May 6, 1929.

American Fears of European Chemical Co-operation

Denunciation of Anti-Trust Laws

SPEAKING at a banquet in New York held in connection with the Eleventh Exposition of Chemical Industries, Mr. E. M. Allen, president of the Mathieson Alkali Works, pointed out plainly the disadvantages and handicaps of the Sherman Anti-Trust Law to American industry under modern conditions, declaring that it was unwieldy and was the best weapon in the hands of foreign cartels in stifling American competition in the sale of chemicals throughout the world. Continuing, Mr. Allen warned the American manufacturers of the impending clash with European cartels, and cited the Allied Chemical and Dye Corporation as an example of an American institution which, by its policies, was equipped to meet the menace from abroad. Mr. Charles C. Concannon, chief of the Chemical Division of the Department of Commerce, who had recently returned from a tour in Europe, was much in accord with Mr. Allen's remark and said that, so far as chemicals were concerned, Europe was very much on its feet, and that the United States must take a greater interest in its foreign policy and in the conditions governing and affecting the policy.

The Expansion of Export Markets Emphasised

A similar point was stressed by Dr. Julius Klein, director of the Bureau of Foreign and Domestic Commerce, in an address given to members of the Wilmington Chamber of Commerce. Expansion of its export market should be the chief object of the American chemical industry, he stated. As a producer of practically one-half of the world's chemical requirements it was felt in exporting but 7 or 9 per cent. of their production they were overlooking the possibilities inherent in developing foreign markets for those products. Their principal competitors—Germany, England, and France—exported from 25 to 33 per cent. of their production. Singularly, these competitors were their best customers, which was a tribute to the quality and competitive characters of their products.

Vacant Appointments

Professor of Organic Chemistry, Pure and Applied, in the University of Sydney, New South Wales. £1,100. The Agent-General for New South Wales, Australia House, Strand, London, W.C.2. November 9.

Chief Lecturer in Chemistry for day and evening classes in the Department of Pure and Applied Chemistry, Woolwich Polytechnic, London, S.E.18. £276–£15–£528 plus £96 for special responsibility. The Principal.

Research Chemist for plasters, etc., for dentistry. £500. The Secretary, Department of Scientific and Industrial Research, 16, Old Queen Street, Westminster, London, S.W.1. November 7.

From Week to Week

SIR MAX MUSPRATT proposes to go to Australia shortly on an important business visit.

DR. F. BERGIUS, on the occasion of his forty-third birthday, has had conferred upon him the Dr.phil. degree of the University of Heidelberg.

BEET SUGAR NEWS.—A proposal is on foot, states a Welsh correspondent, to establish a beet sugar factory on the tidal area of the River Towy below Carmarthen Town.

THE SOCIETY OF PUBLIC ANALYSTS will hold a meeting on Wednesday, November 2, at the Institute of Pathology and Research, St. Mary's Hospital, at 8.15 p.m.

UNIVERSITY NEWS.—*Oxford:* On Friday, October 21, the Chancellor of the University, Viscount Cave, declared open the new School of Biochemistry. The building is the outcome of a gift of £75,000 from the Rockefeller Trustees.

DISEASES OF OCCUPATIONS reported during September, 1927, included 4 cases of lead poisoning in white and red lead works, and 1 in paint and colour works; 15 cases of aniline poisoning; and 3 cases of chrome ulceration in the dyeing and finishing trades.

THE AGDEN SALT WORKS CO., LTD., of Heatley, Cheshire, which has been engaged in the past few years in developing its salt property, has installed new plant, which was opened last week, for the production of lump salt, dairy salt, and packet salt; hitherto only common salt was produced.

AT A MEETING LAST WEEK of the preliminary International Conference on the abolition of artificial restrictions on international commerce, Sir Sydney Chapman urged that a reasonable view should be taken of restrictions, some of which, he suggested, were necessitated by the interests of the country imposing them; he instanced dyes as a case in point.

JUDGMENT WAS RESERVED in the Court of Appeal on Thursday, October 20, in the appeal by Mr. Morris Freedman (trading as the Economical Bazaars, Ltd.) against the injunction granted by Mr. Justice Astbury, to the Palm Olive Co. (of England), Ltd., restraining Mr. Freedman from selling Palm Olive soap at less than the price of sixpence per cake fixed in the agreement.

A FARADAY MEMORIAL COLLECTION is to be established in the Southwark Reference Library by the local borough council. The collection will consist of the biographies, portraits, and published works of the scientist, together with the latest books on the sciences and their applications, particularly electricity, with which his name is so illustriously identified. This it is proposed to achieve by means of a memorial fund.

THE EIGHTEENTH ANNUAL EXHIBITION of electrical, optical and other physical apparatus will be held by the Physical and Optical, Societies on January 10, 11 and 12, 1928, at Imperial College, South Kensington. The exhibition will include the Trade Section as in previous years. Offers of exhibits should be made not later than November 16, to the Secretary, Physical and Optical Societies, 1, Lowther Gardens, Exhibition Road, London, S.W.7.

THE ELECTROPLATERS' AND DEPOSITORS' TECHNICAL SOCIETY held the opening meeting of its third session on Wednesday, October 19, at the Northampton Polytechnic Institute, London. The annual election was held, the committee being re-elected. Mr. R. H. T. Barklie read a paper on "Stress in Electro-deposited Metals." The next meeting takes place on November 9, when Mr. E. A. Ollard will read a paper on "The Theory of Chromium Plating."

MR. H. G. BEARD, research assistant in the Department of Colour Chemistry at the Technical College, Huddersfield, has been appointed research chemist at Woolwich Arsenal. Mr. Beard has received the whole of his chemical education at the Huddersfield Technical College, and for the past four years has been working under the supervision of Dr. H. H. Hodgson, head of the Department, with whom he has been the joint author of numerous papers published by the Chemical Society and the Society of Chemical Industry.

A MEETING OF THE CREDITORS in the voluntary liquidation of British Leathertex, Ltd., chemical process manufacturers, of Crescent Lane, South Side, Clapham Common, London, S.W., was held on Tuesday. The liabilities were disclosed as £1,000 2s. 5d., with a deficiency of £953 12s. 5d. Colonel Meurling, who was a cash creditor for £510, was willing to waive his claim for the benefit of the trade creditors. The matter was left in the hands of the liquidator, Mr. Pearson, of Thorpe and Pearson, accountants, of 5, John Street, Bedford Row, London, W.C.

IN VIEW OF THE RECENT RESIGNATION by Dr. G. W. Monier-Williams of the Honorary Secretaryship of the London Section of the Society of Chemical Industry, the Committee feel that many members would welcome an opportunity of expressing their high appreciation of the manner in which he discharged his duties as Secretary during the past seven years. The Committee proposes that a small fund should be raised with which to purchase a gift to be presented to him at an early meeting of the Section. Contributions not exceeding 2s. 6d. may be sent to Dr. R. T. Colgate, at Central House, Finsbury Square, E.C.2, not later than November 5.

FATAL INDUSTRIAL ACCIDENTS reported during September included 5 in chemicals, etc., factories; and 1 in a textile bleaching and finishing factory.

FREDERICK FORWOOD AND CO., LTD., United Kingdom Oil Co., Ltd., and Weldless Couplings, Ltd., state that their offices have been removed to Imrie House, 33, King William Street, London, E.C.4 (Telephone: Central 4579.)

THE CENTENARY OF BERTHELOT was celebrated in Paris on Tuesday. After a reception at the Hotel de Ville, the French and foreign delegates attended a ceremony at the Sorbonne, where M. Painlevé, Minister of War, represented the President.

DR. J. W. MELLOR, F.R.S., hon. general secretary of the Ceramic Society, and principal of the pottery department of the North Staffordshire Technical College, was entertained to dinner by the Ceramic Society on Thursday, October 20, at Stoke, on the occasion of a presentation to him by the Ceramic Society to celebrate his election as a Fellow of the Royal Society.

AN INQUEST was held recently on Arthur Cyril Percy Lunn, aged 31, a chemical research worker, of King's College, Cambridge, who was found lying at the bottom of a hill at Bulford, near a damaged motor cycle. A police officer stated that two shackle pins were missing from the machine, and the engine had fallen out on the road. A verdict of accidental death was returned.

OWING TO A RISE OF ONE POINT in the cost of living figure 80,000 dyeworkers in Yorkshire, Lancashire, Cheshire, Derbyshire, and parts of Scotland will have their cost of living wages advanced by 1d. in the case of boys and 3d. in the case of adult males on the first pay day in November. Against this has to be set the loss of the Mackenzie award which it has been agreed shall be cancelled, so that a loss in wages will ensue.

THE Court of Arbitration, Brussels, declares that the claim by Dr. H. Dreyfus that the Tubize Co. had not developed the artificial silk trade in Germany, Poland, and Czechoslovakia, was not well founded, and the agreement of 1922 therefore continues. It was stated recently that a combine might be formed in Berlin as a result of the decision of the Court, and the managers of the Tubize Co. were said to have gone to Berlin for negotiations with the Vereinigte-Glanzstoff-Fabriken A.G.

JUDGMENT WAS GIVEN FOR THE PLAINTIFF in an action in the King's Bench Division brought recently by Hans Hansen Riiser (trading as H.H. Riiser and Co.) against Edgar Frederick Munday, trading as the Silico-Enamel Co., for £273 7s., the price of 19·88 tons of granulated calcium carbide. Defendant claimed to be entitled to repudiate this contract because, as he contended, the material was to be delivered in three weeks, and plaintiff had not complied with that condition. Plaintiff denied there was such a condition.

SIR WILLIAM H. BRAGG, F.R.S., will deliver the Thomas Hawksley lecture of the Institution of Mechanical Engineers on Friday, November 4, at the Institution, Storey's Gate, London, at 6 p.m. He will take as his subject "The Application of X-rays to the Study of the Crystalline Structure of Materials." The lecture will be repeated in Sheffield on November 9, in Leeds on November 10, in Bristol on November 16, in Manchester on November 17, in Glasgow on December 1, and in Birmingham on December 15.

UNEMPLOYED INSURED PERSONS at September 26 in Great Britain and Northern Ireland, in chemicals manufacture numbered 6,030 (males 5,230, females 800); in explosives manufacture, 1,167 (males 840, females 327); in paint, varnish, japan, red and white lead manufacture, 728 (males 589, females 139); in oil, grease, glue, soap, ink, match, etc., manufacture, 5,137 (males 4,263, females 874). The percentages unemployed, and increases or decreases of percentage unemployment as compared with last year, in the same industries in the same order was as follows:—6·4 (a decrease of 3·2); 6·3 (a decrease of 1·8); 4·2 (a decrease of 0·6); and 6·4 (a decrease of 0·4) per cent.

Obituary

ALBERT COBENZL, the well-known German chemist, on October 14.

CÆSAR SCHULL, chief of the firm of Carl Schleicher and Schüll, on October 6, aged 78.

PROFESSOR J. BAUMANN, of Innsbruck University, assistant-director of the Verein für Chemische und Metallurgische Produkte in Aussig-Karlsbad, on August 17.

MR. RUSSELL, manager of the Anglo-Chilean Nitrate Co., and United States Consul at Tocopilla, Chile, who is reported to have died of gunshot wounds inflicted on him by a Chilean at the Maria Elena nitrate field on October 23.

SIR GERARD ALBERT MUNTZ, Bart., aged 62, at Stratford-on-Avon, on October 23. He was President of the Institute of Metals in 1910-1911, and was chairman of the Metallurgical Section of the Department of Scientific Research. He was also prominently associated with the Brass and Copper Tubes Associations, and was managing director and consultant director of Muntz's Metal Co. He investigated, among other things, the deterioration of brass condenser tubes and the electrolytic action of sea water on sheathing.

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INORGANIC.—On the behaviour of carbon and sulphur at high temperatures and on carbon sulphides. J. P. Wibaut. *Z. angew. Chem.*, October 13, pp. 1136–1137.

OILS, ETC.—The various bromine-iodine values of oils and fats. W. Vaubel. *Z. angew. Chem.*, October 13, pp. 1143–1145.

ORGANIC.—The production of benzaldehyde and benzoic acid on the large scale. R. Freund. *Chem.-Zeit.*, October 19, pp. 803–804.

RUBBER.—The constitution of rubber. R. Pummerer. *Z. angew. Chem.*, October 20, pp. 1168–1172.

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OILS.—Composition of the body oil from sperm whale. I. Fatty acids. II. Unsaponifiable matter. Y. Toyama. *J. Soc. Chem. Ind. Japan*, August, pp. 137–138B, 138–139B (in English).

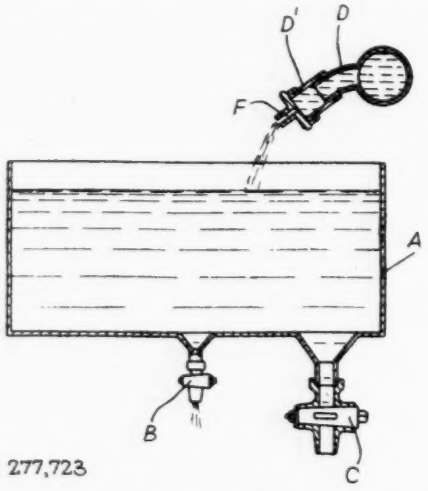
Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

277,723. White Lead, Manufacture of—by Electrolysis. R. S. Carreras, 8, Prat de la Riba, San Clemente de Llobregat, Barcelona, Spain. Application date, May 17, 1926.

The object is to ensure that the electrolyte is maintained saturated with carbon dioxide during the manufacture of white lead. This is effected by withdrawing the electrolyte

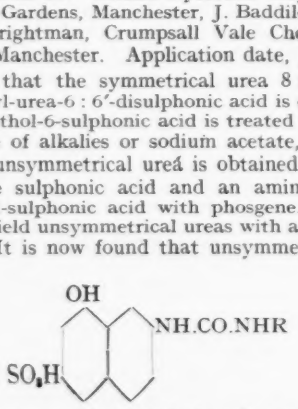


277,723

continuously in a small stream and replacing it with fresh or regenerated electrolyte at the same rate. The liquid saturated with carbon dioxide is introduced continuously through a small jet nozzle F which is screwed on to a sleeve D′ mounted on the supply pipe D. The vat A is provided with a discharge valve B which can be adjusted so that the liquid is withdrawn at the same rate as it is supplied by the nozzle F. A larger valve C is provided, by means of which the tank may be rapidly emptied for the extraction of the white lead, and the tank may be rapidly filled by unscrewing the nozzle F. The electrolyte may be a 2·5 per cent. solution of sodium chlorate.

277,756. Azo Dyestuffs and Intermediate Compounds, Manufacture of. British Dyestuffs Corporation, Ltd., 70, Spring Gardens, Manchester, J. Baddiley, P. Chorley, and R. Brightman, Crumpsall Vale Chemical Works, Blackley, Manchester. Application date, June 25, 1926.

It is known that the symmetrical urea 8 : 8′-dihydroxy-2 : 2′-dinaphthyl-urea-6 : 6′-disulphonic acid is obtained when 2-amino-8-naphthol-6-sulphonic acid is treated with phosgene in the presence of alkalies or sodium acetate, and that the corresponding unsymmetrical urea is obtained by treating a mixture of the sulphonic acid and an amino-naphthol or amino-naphthol-sulphonic acid with phosgene. Monoformyl diamines also yield unsymmetrical ureas with aminonaphthol-sulpho-acids. It is now found that unsymmetrical ureas of the type



in which R denotes a substituted phenyl or naphthyl group, are obtained by treating with phosgene an equimolecular mixture of 2-amino-8-naphthol-6-sulphonic acid or its salts with aminoacetanilides or with sulphonated amines of the benzene and naphthalene series, excluding sulphonated diamines and their monoformyl derivatives and amino-naphthol sulphonic acids, in the presence of an alkali metal acetate, carbonate, or hydroxide. Compounds particularly suitable for the reaction include *p*-amino-acetanilide, anilin sulphonic acids, and naphthylamine sulphonic acids. New azo dyestuffs can be obtained by coupling these unsymmetrical ureas with any of the known diazo compounds. Such dyestuffs may be employed for dyeing regenerated cellulose silks and cotton. Examples are given of the treatment of 2-amino-8-naphthol-6-sulphonic acid, and para-amino-acetanilide to obtain the sodium salt of *p*-acetamido-phenyl-8-hydroxy-6-sulpho-2-naphthyl-urea; 2-amino-8-naphthol-6-sulphonic acid and sodium salt of α-naphthylamine-4-sulphonic acid to obtain the sodium salt of 8′-hydroxy-1 : 2′-dinaphthyl-urea-4 : 6′-disulphonic acid; 2-amino-8-naphthol-6-sulphonic acid and the sodium salt of β-naphthylamine-6-sulphonic acid to obtain the sodium salt of 2 : 2′-dinaphthylurea-6 : 6′-disulphonic acid and the sodium salt of 8-hydroxy-2 : 2′-dinaphthylurea-6 : 6′-disulphonic acid; aceto-*p*-aminophenyl-8-hydroxy-2-naphthylurea-6-sulphonic acid and diazotised dehydrothio-*p*-toluidine sulphonic acid, or *p*-aminoazo-benzene sulphonic acid, or *p*-chloraniline or the aminoazo compound formed by coupling diazotised metanilic acid with α-naphthylamine, to obtain dyestuffs for viscose silk and cotton. Some examples of dyestuffs obtained by further treatment of the above products are also given.

277,769. Utilisation of Waste Acid Liquors in Chemical Processes. C. A. Klein, 7, Queen Anne's Grove, Bush Hill Park, Enfield, Middlesex, and R. S. Brown, 36, Manor House, Marylebone Road, London. Application date, July 8, 1926.

Weak acid liquor containing sulphuric acid which may contain also organic matter and small quantities of iron in solution is obtained in processes such as that described in Specification No. 243,081 (see The Chemical Age, Vol. XIII, p. 662), and the object is to utilise this acid. The liquor is bleached with animal charcoal, sulphur dioxide, or a bleaching agent, or a small quantity of a barium salt may be added to obtain a precipitate which carries most of the colouring matter. The decolourised liquid is then treated with barium oxide or carbonate to obtain the barium sulphate known as blanc fixe. Complete precipitation is ensured by adding a small quantity of an acid such as hydrochloric, nitric, or acetic acid, or an alkali salt of these acids, which is capable of yielding a soluble barium salt which can be decomposed by sulphuric acid. The whole of the sulphuric acid is not neutralised, so that any iron remains in solution. The precipitated barium sulphate is filtered, washed and dried, and the remaining waste liquor is nearly neutral and is easily disposed of.

277,774. Bismuth Salts of Aryl-Arsinic Acids, Manufacture of Solutions of. A. Haythornthwaite, 79, West Side, Clapham Common, S.W.4, and May and Baker, Ltd., Garden Wharf, Church Road, Battersea, London, S.W.11. Application date, July 16, 1926.

The object is to obtain solutions of bismuth salts of aryl-arsinic acids which are usually only obtained in the form of suspensions. The solution is obtained by the action on bismuth salts of an alkaline base and a solution of a stabilising organic salt such as a salt of an alkaline base with an aliphatic hydroxy-polybasic acid such as citric or tartaric acid. The two alkaline bases mentioned may be the same or different, and may be ammonia or a strongly basic substituted ammonia, or other strong non-toxic organic base such as piperazine, or a fixed caustic alkali. Thus bismuth-3-acetyl-amino-4-oxyphenyl-arsenate may be treated with piperazine hydrate, sodium potassium tartrate and water, and the solution nearly neutralised with acetic acid. Alternatively, the bismuth salt may be prepared *in situ* in the solution in which it is dissolved. Other examples are also given.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :— 253,950 (I.G. Farbenindustrie Akt.-Ges.), relating to production of tertiary nitriles, see Vol. XV, p. 233; 255,493 (H. Spindler), relating to conversion of methane into a substance similar to petroleum, see Vol. XV, p. 307; 260,577 (C. Mannich), relating to manufacture of cyclotrimethylene-aryl-pyrazolones, see Vol. XVI, p. 30; 262,090 and 272,842 (Omnium des Industries Chimiques), relating to synthetic ammonia, see Vol. XVI, p. 144, and Vol. XVII, p. 173; 262,099 (I.G. Farbenindustrie Akt.-Ges.), relating to destructive hydrogenation of moist solid fuels, see Vol. XVI, p. 144; 263,773 (C. Mannich), relating to alkyl and aralkyl derivatives of cyclo-trimethylene-aryl-pyrazolones, see Vol. XVI, p. 239; 263,845 (I.G. Farbenindustrie Akt.-Ges.), relating to benzanthrone derivatives, see Vol. XVI, p. 263; 266,744 (I.G. Farbenindustrie Akt.-Ges.), relating to treatment of crude nitrate of soda, see Vol. XVI, p. 487; 268,301 (New Jersey Zinc Co.), relating to zinc oxide, see Vol. XVI, p. 515; 269,174 (I.G. Farbenindustrie Akt.-Ges.), relating to precipitation of heavy metals from ammoniacal solutions, see Vol. XVI, p. 579.

International Specifications not yet Accepted

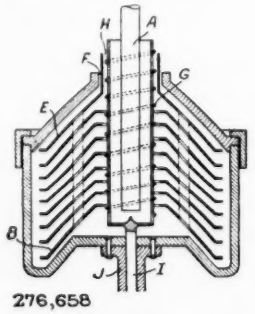
276,372. DYES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, August 21, 1926.

A monoaminoazo dye is treated with an aromatic nitro compound containing at least one exchangeable halogen atom and at least one sulpho- or carboxyl group, to obtain arylazo-diarylamines. The aminoazo dyes may be of the benzene or naphthalene series, or may contain a benzene and a naphthalene nucleus, as well as sulpho, carboxyl, or nitro groups. Those products containing not more than one sulpho group are suitable for dyeing cellulose esters and ethers. The condensation may be effected in the presence of sodium acetate or chalk, in some cases under pressure. Examples are given of the condensation of *p*-aminoazobenzene with potassium 1-chlor-2:6-dinitrobenzene-4-sulphonate, *p*-aminoazobenzene sulphonic acid with potassium 1-chlor-2:6-dinitrobenzene-4-sulphonate, and aminoazobenzene with 1-chlor-2-nitrobenzene-4-sulphonic acid under pressure.

276,617. BUTYRIC ACID AND ITS HOMOLOGUES. Soc. des Brevets Etrangers Lefranc et Cie, 18, Avenue Matignon, Paris. International Convention date, August 27, 1926.

Crude calcium butyrate obtained from the fermentation process of making butyric acid is treated with hydrochloric acid. The mixture separates into two layers, the upper containing most of the butyric acid of 80-90 per cent. strength, and the lower a solution of calcium chloride containing acetic and other aliphatic acids. The lower layer is distilled in superheated steam to obtain the acids. The upper layer is rectified over aluminium sulphate or fused calcium chloride. If commercial hydrochloric acid is used, it is previously treated with iron or zinc to remove free chlorine.

276,658. PARAFFIN WAX. Aktiebolaget Separator-Nobel, 8, Fleminggatam, Stockholm. (Assignees of Aktiebolaget Separator, 8, Fleminggatan, Stockholm.) International Convention date, August 24, 1926.



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Lubricating or other mineral oil is treated with trichlorethylene or other liquid, making the oil heavier than the wax, and then treated in a centrifugal separator. The liquid is fed through a pipe A and passes into the bowl which is mounted on a rotating shaft J. The liquid then passes through the perforated discs B, E, to the outlet F, while the separated wax is conveyed to the outlet H by a screw G carried by a shaft I which is rotated at a speed different from that of the bowl. A movable piston, or an endless chain or other conveyor may replace the screw G.

276,659. SULPHURIC ACID. H. Petersen, 6, Hohenzollernstrasse, Steglitz, Berlin. International Convention date, August 28, 1926.

In the manufacture of sulphuric acid by the Opl process, most of the nitrous oxides are liberated in the first production tower which is of large size irrigated intensively with nitrated acid. The tower may be provided with atomisers or mixers, or may be packed with broken material of about 40 mm. size.

LATEST NOTIFICATIONS.

279,033. Process for the production of photographic films. I. G. Farbenindustrie Akt.-Ges. October 16, 1926.

279,036. Process for opening-up materials containing cellulose. I. G. Farbenindustrie Akt.-Ges. October 13, 1926.

279,037. Production of nitrate of lime. Appareils et Evaporateurs Kestner. October 16, 1926.

279,047. Supports made of cellulose derivatives for use in the manufacture of sheets of material soluble in organic solvents. I. G. Farbenindustrie Akt.-Ges. October 16, 1926.

279,070. Manufacture of acetic anhydride. Consortium für Elektrochemische Industrie Ges. October 18, 1926.

279,072. Hydrogenation of coals, tars, mineral oils, and the like. I. G. Farbenindustrie Akt.-Ges. October 14, 1926.

279,095. Methods of manufacturing hydrocarbons from calcium carbide. Corson, M. G. October 14, 1926.

279,106. Process of producing tetra-ethyl lead. Daudt, H. W. October 15, 1926.

279,119. Conveying-devices. Naamlooze Vennootschap Philips' Gloeilampenfabrieken. October 15, 1926.

279,133. Manufacture of water-soluble dinitroarylaminodiarylamines. I.G. Farbenindustrie Akt.-Ges. October 18, 1926.

279,134. Manufacture of dinitrohalogenaryls. I. G. Farbenindustrie Akt.-Ges. October 18, 1926.

279,135. Process of dyeing cellulose esters and cellulose ethers. I. G. Farbenindustrie Akt.-Ges. October 18, 1926.

279,136. Manufacture of aromatic mercaptans. I. G. Farbenindustrie Akt.-Ges. October 18, 1926.

Specifications Accepted with Date of Application

254,757. Electrolytic deposition of chromium. General Motors Corporation. July 6, 1925.

255,876. Ammonium sulphate crystals, Process and apparatus for neutralising. W. Demann. July 24, 1925.

258,553. Heterocyclic compounds, Manufacture of. I.G. Farbenindustrie Akt.-Ges. September 15, 1925. Addition to 251,270.

263,809. Salts, Purification of solutions of. A. Vohl and Co., Akt.-Ges. December 24, 1925.

268,302. Metallurgical operations. New Jersey Zinc Co. March 25, 1926.

274,016. Treating low carbon steel and irons. F. Krupp Akt.-Ges. July 7, 1926.

276,295. Oxidising ammonia by means of oxygen, Method of. F. G. Liljenroth. August 19, 1926.

278,167. Reduction of iron ores. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) March 29, 1926.

278,399. Dyes and dyeing. Morton Sundour Fabrics, Ltd. J. Morton, B. Wylam, J. E. G. Harris, and J. I. M. Jones. May 3, 1926. Addition to 251,491.

278,411. Zinc waste, Process for the treatment of. E. Bury. March 24, 1927.

278,415. Coating metals with aluminium or magnesium or aluminium or magnesium alloy. R. Hopfelt and C. P. Nolden. July 1, 1926.

278,417. Production of colouring matters. L. J. Hooley, J. Thomas, and Scottish Dyes, Ltd. July 2, 1926.

278,444. Organic compounds of arsenic, Manufacture of. R. W. E. Stickings, and May and Baker, Ltd. July 8, 1926.

278,463. Chlorides of ortho-hydroxy-carboxylic acids of polynuclear hydrocarbons. British Synthetics, Ltd., and E. B. Higgins. July 20, 1926.

278,577. Steam distillatiom of coal and the like. Synthetic Ammonia and Nitrates, Ltd., and R. E. Slade. February 21, 1927.

278,578. Hydrogen and phosphoric acid, Process for producing. E. Urbain. December 7, 1926.

Applications for Patents

Beavis, J. A. F., and Schindelmeiser, J. Production of nitro and amino derivatives of cymene. 27,694. October 18.

British Celanese, Ltd. Treatment of organic derivatives of cellulose. 28,151. October 22. (United States, October 23, 1926.)

British Celanese, Ltd. Apparatus for manufacture of artificial silk, etc. 28,163. October 22.

Bysow, B. Producing diolefines from naphtha, etc. 27,962. October 20.

Carbide and Carbon Chemicals Corporation. Recovery of absorbable substances. 28,158. October 22.

Carpmael, A., and I. G. Farbenindustrie Akt.-Ges. Manufacture of of benzanthraquinone derivatives, etc. 27,668. October 18.

Carpmael, A., and I. G. Farbenindustrie Akt.-Ges. Manufacture of disubstituted guanidines. 27,822. October 19.

Carpmael, A., and I. G. Farbenindustrie Akt.-Ges. Manufacture of products by gaseous reaction, etc. 27,938. October 20.

Carpmael, A., and I. G. Farbenindustrie Akt.-Ges. Manufacture of cellulose ethers. 28,079. October 21.

Carpmael, R. H., and I. G. Farbenindustrie Akt.-Ges. Closures for containers. 27,667. October 18.

Coley, H. E. Distillation process for zinc oxides. 27,495. October 17.

Craig, G. Low-temperature distillation of coal, etc. 27,842. October 20.

Du Pont de Nemours and Co., E. I., and Nobel Industries, Ltd. Production of condensation products. 28,054. October 21.

Du Pont de Nemours and Co., E. I. Coating-compositions. 27,965. October 20. (United States, July 22.)

Florentin, D., Kling, A., and Matignon, C. Process of obtaining light hydrocarbides from complex organic compounds. 27,952. October 20. (France, October 23, 1926.)

Hailwood, A. J., Imperial Chemical Industries, Ltd., Naunton, W. J. S., and Shepherdson, A. Manufacture, etc., of pigments for colouring rubber. 28,089. October 21.

Hercules Powder Co. Treating nitrocellulose. 27,940. October 20. (United States, July 1.)

Hercules Powder Co. Nitrated carbohydrate solutions. 27,941, 27,942. October 20. (United States, July 8.)

Hirst, H. S. Oxidation of volatile organic compounds. 27,641. October 18.

Holzverkohlungs-Industrie Akt.-Ges. and Roka, K. Production of ketones. 27,655. October 18.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Recovery of hydrocarbons, etc. 27,497. October 17.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of cask bodies. 27,498. October 17.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of cask ends. 27,499. October 17.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Preservation of perishable goods. 27,500. October 17.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Internal-combustion turbines. 27,778. October 19.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Manufacture of hydrocarbons of low-boiling point. 27,909. October 20.

I. G. Farbenindustrie Akt.-Ges. and Johnson, J. Y. Eliminating sulphur compounds from gases. 27,910. October 20.

I. G. Farbenindustrie Akt.-Ges. and Imray, O. Y. Manufacture of derivatives of pyrazolanthrone. 28,036. October 21.

I. G. Farbenindustrie Akt.-Ges. Photographic developer. 27,509. October 17. (Germany, November 19, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of gland preparations. 27,510. October 17. (Germany, October 15, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of physiologically-active extracts. 27,511. October 17. (Germany, October 20, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of disinfecting, etc., preparations. 27,546. October 17.

I. G. Farbenindustrie Akt.-Ges. Manufacture of water-soluble dinitroarylaminodiarylamines. 27,683. October 18. (Germany, October 18, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of dinitrohalogen-aryls. 27,684. October 18. (Germany, October 18, 1926.)

I. G. Farbenindustrie Akt.-Ges. Dyeing cellulose esters, etc. 27,685. October 18. (Germany, October 18, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of aromatic mercaptans. 27,686. October 18. (Germany, October 18, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of vat dyestuffs. 28,037. October 21. (Germany, October 23, 1926.)

Imperial Chemical Industries, Ltd. Treatment of coal distillation gases. 27,513. October 17.

Imperial Chemical Industries, Ltd., and Riley, A. Compounds of aromatic diamines. 27,543. October 17.

Imperial Chemical Industries, Ltd. Carburettors. 27,627. October 18.

Imperial Chemical Industries, Ltd. Oxidation of volatile organic compounds. 27,641. October 18.

Imperial Chemical Industries, Ltd., and Jenkins, W. J. Nitrocellulose compositions. 27,691. October 18.

Laing, B., and Nielsen, H. Distillation of carbonaceous materials, etc. 27,831, 27,832. October 19.

Lockwood, A. A. Removal of sulphur from mineral oil. 27,971. October 20.

Pritchard, D. A., United Alkali Co., Ltd. Production of caustic soda. 28,066. October 21.

Scottish Dyes, Ltd., and Thomas, J. Manufacture of dyestuffs, etc. 27,525. October 17.

Silesia, Verein Chemischer Fabriken. Separation of mono- and dialkyl derivatives of aromatic amines. 28,062. October 21. (Germany, November 19, 1926.)

Soc. of Chemical Industry in Basle. Manufacture of vat dyestuffs. 27,915. October 20. (Switzerland, October 20, 1926.)

Standardisation of Coal Analysis

An important step forward in the campaign to standardise the analysis of coal, with a view to determining its value to purchasers, was made at a conference on Tuesday, held at the Institution of Civil Engineers, London. The conference, over which Sir Richard Glazebrook, formerly director of the National Physical Laboratory, presided, included representatives of both producers and users, such as the Mining Association of Great Britain, Government Departments, London County Council, railway companies, the Coal Merchants' Federation of Great Britain, coal exporters, and numerous engineering institutions. The object of the conference was to discuss whether the time had arrived for setting up by the British Engineering Standards Association of some approved methods as British standards for the analysis and sampling of coal, in order, particularly, to assist the export market of coal to regain some of the prominence it held before the war. The conference desired a standard which would be effective not only nationally, but internationally. After considering the matter in detail, and particularly the work already accomplished by the Fuel Research Board of the Department of Scientific and Industrial Research, it was unanimously decided that the British Engineering Standards Association should set up a representative committee to go into the question and to make recommendations for the commercial analysis and sampling of coal.

Low Temperature Carbonisation in U.S.

An agreement has just been signed in the United States between the Public Service Electric and Gas Co., of New Jersey, and the International Combustion Engineering Corporation, of New York, to put down in the township of Raritan, New Jersey, a low-temperature carbonisation plant which will be the largest in the world. This is to be completed by March 1, 1929, and the plant will consist of eight "K.S.G." process retorts, each with a throughput of 80 tons of coal per day, that is, 640 tons a day for the complete installation, giving per day 2,500,000 to 3,000,000 cubic feet of rich gas of 800 B.Th.U. per cubic foot. Other products include 450 tons of smokeless fuel and 16,000 gallons of low-temperature tar. The International Combustion Engineering Corporation control, along with their associated company in London—Coal Oil Extraction, Ltd.—the "K.S.G." process, and also the McEwen-Runge process for the low-temperature carbonisation of pulverised coal, the invention of S. McEwen, of London, while they have a working arrangement with Imperial Chemical Industries, Ltd.

A Well-Equipped New Technical College

The new Walker Technical College at Oakengates, Shropshire, which was opened on October 21 by Viscount Chelmsford, has been equipped with the most modern apparatus, and comprises engineering and mining departments, together with laboratories for chemistry and physics, and lecture rooms. The mining laboratory is provided with an experimental fan for the investigation of problems relating to mine ventilation, the installation being similar to that in use in the Royal School of Mines in South Kensington, and the dark room contains apparatus for the testing of safety lamps and the examination of gas masks. Besides adult courses for mine workers, a preliminary mining course has been arranged for boys between 14 and 16, and is designed to awaken in these boys intelligent interest in their work. The College has cost £30,000.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £34 per ton; powder, £36 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages extra.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 2s. 5d. to 2s. 10d. per gall.; pyridinised industrial, 2s. 7d. to 3s. per gall.; mineralised, 3s. 6d. to 3s. 10d. per gall.; 64 O.P., 1d. extra in all cases; prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3½d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2½d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—7½d. to 8d. per lb. Crude 60's, 2s. 3d. to 2s. 5d. per gall.

ACID CRESYLIC 99/100.—2s. 11d. to 3s. per gall. 97/99.—2s. 4½d. to 2s. 5½d. per gall. Pale, 95%, 2s. 3d. to 2s. 4d. per gall. Dark, 95%, 2s. 1d. to 2s. 2d.

ANTHRACENE.—A quality, 2½d. per unit. 40%, £5 per ton.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7½d. to 8d. per gall.

BENZOLE.—Crude 65's, 9½d. to 10d. per gall., ex works in tank wagons. Standard Motor, 1s. 1½d. to 1s. 2½d. per gall., ex works in tank wagons. Pure, 1s. 5d. to 1s. 7d. per gall., ex works in tank wagons.

TOLUOLE.—90%, 1s. 4d. to 1s. 6d. per gall. Firm. Pure, 1s. 6d. to 2s. per gall.

XYLOL.—1s. 3d. to 1s. 10d. per gall. Pure, 1s. 9d. per gall.

CREOSOTE.—Cresylic, 20/24%, 10d. to 11d. per gall.; middle oil, 8d. to 9d. per gall. Heavy, 9d. per gall. Standard specification, 7½d. to 7¾d. ex works. Salty, 7d. per gall. less 1½%.

NAPHTHA.—Crude, 9d. to 10d. per gall. Solvent 90/160, 9½d. to 10½d. per gall. Solvent 95/160, 1s. 3d. to 1s. 4d. per gall. Solvent 90/190, 8½d. to 1s. 3d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £5 per ton. Whizzed or hot pressed, £8 per ton.

NAPHTHALENE.—Crystals, £11 10s. to £13 10s. per ton. Quiet. Flaked, £12 10s. to £13 per ton, according to districts.

PITCH.—Medium soft, 84s. to 85s. per ton, f.o.b., according to district. Market firm.

PYRIDINE.—90/140, 5s. 9d. to 6s. 6d. per gall. 90/180, 4s. to 5s. per gall. Heavy, 4s. to 4s. 6d. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—4s. 9d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 7½d. per lb. Only limited inquiry.

p-CRESOL 32/34° C.—2s. 8½d. per lb. Only limited inquiry.

DICHLORANILINE.—1s. 10d. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—8½d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—2s. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

N. W. Acid.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 10s. to £10 per ton. Good demand. Grey, £14 10s. to £15 per ton. Liquor, 9d. per gall.

CHARCOAL.—£6 to £9 per ton, according to grade and locality. Foreign competition severe.

IRON LIQUOR.—1s. 3d. per gall. 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10d. per gall.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 11d. to 4s. 3d. per gall. Solvent, 4s. 3d. per gall.

WOOD TAR.—£4 to £5 per ton.

BROWN SUGAR OF LEAD.—£40 15s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 6d. to 2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £50 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 1d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5½d. to 6½d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—6s. to 6s. 3d. per lb.

ZINC SULPHIDE.—1s. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 3½d. to 2s. 5d. per lb.

ACID, BENZOIC B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. to 1s. 3d. per oz., according to quantity.

ACID, BORIC B.P.—Crystal, 40s. to 43s. per cwt.; powder, 44s. to 47s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—1s. 6½d. to 1s. 7½d. per lb., less 5%.
ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.
ACID, SALICYLIC, B.P. PULV.—1s. 2½d. to 1s. 4d. per lb.; Technical.—11½d. to 1s. per lb. Good demand.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—1s. 3½d. per lb., less 5%.
AMIDOL.—9s. per lb., d/d.
ACETANILIDE.—1s. 6d. to 1s. 8d. per lb. for quantities.
AMIDOPYRIN.—8s 6d. per lb.
AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity.
AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated: 1s. per lb.
ATROPINE SULPHATE.—9s. 6d. per oz.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—3s. 3d. per lb. spot.
BISMUTH CARBONATE.—9s. 9d. to 9s. 10d. per lb
BISMUTH CITRATE.—9s. 6d. to 9s. 9d. per lb.
BISMUTH SALICYLATE.—8s. 9d. to 9s. per lb.
BISMUTH SUBNITRATE.—7s. 9d. to 8s. per lb.
BISMUTH NITRATE.—5s. 9d. to 6s. per lb.
BISMUTH OXIDE.—13s. 9d. to 14s. per lb.
BISMUTH SUBCHLORIDE.—11s. 9d. to 12s. per lb.
BISMUTH SUBGALLATE.—7s. 9d. to 8s. per lb. Extra and reduced prices for smaller and larger quantities respectively; Liquor Bismuthi B.P. in W. Qts. 1s. 1d. per lb.; 12 W. Qts. 1s. per lb.; 36 W. Qts. 11½d. per lb.
BORAX B.P.—Crystal, 24s. to 27s. per cwt.; powder, 26s. to 29s. per cwt. according to quantity. Carriage paid any station in Great Britain, in ton lots.
BROMIDES.—Potassium, 1s. 9½d. to 1s. 10½d. per lb.; sodium, 2s. to 2s. 1d. per lb.; ammonium, 2s. 3d. to 2s. 4d. per lb.; granulated, ½d. per lb. less; all spot. Large quantities at lower rates.
CALCIUM LACTATE.—1s. 2d. to 1s. 3½d. per lb
CAMPHOR.—Refined flowers, 2s. 11d. to 3s. 1d. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—3s. 2d. to 3s. 4d. per lb.
CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.
CREOSOTE CARBONATE.—6s. per lb.
ETHERS.—S.G. ·730—1s. 1½d. to 10½d., drums; other gravities at proportionate prices.
FORMALDEHYDE.—£39 per ton, in barrels ex wharf
GUAIACOL CARBONATE.—4s. 9d. to 5s. per lb.
HEXAMINE.—2s. 3d. to 2s. 6d. per lb.
HOMATROPINE HYDROBROMIDE.—30s. per oz.
HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gal. B.P., 10 vols., 2s. 3d. per gal. In carboys. Winchesters, 2s. 11d. to 3s. 9d. per gal.; 20 vols., 4s. 3d. per gal.; Winchesters, 5s. per gal. Special prices for larger quantities.
HYDROQUINONE.—2s. 11d. to 3s. 2d. per lb., in cwt. lots.
HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.
IRON AMMONIUM CITRATE.—B.P., 2s. 1d. to 2s. 4d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 2d. to 2s. 5d. per lb.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
MAGNESIUM CARBONATE.—Light commercial, £31 per ton net.
MAGNESIUM OXIDE.—Light commercial, £62 10s. per ton, less 2½%; Heavy Commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.
MENTHOL.—A.B.R. recrystallised B.P., 17s. 9d. per lb. net; Synthetic detached crystals, 8s. 6d. to 12s. 6d. per lb., according to quantity: Liquid (95%), 11s. 3d. per lb.
MERCURIALS B.P.—Up to 1 cwt. lots, Red Oxide, 7s. 6d. to 7s. 7d. per lb., levig., 7s. to 7s. 1d. per lb.; Corrosive Sublimate, Lump, 5s. 9d. to 5s. 10d. per lb., Powder, 5s. 2d. to 5s. 3d. per lb.; White Precipitate, Lump, 5s. 11d. to 6s. per lb., Powder, 6s. to 6s. 1d. per lb., Extra Fine, 6s. 1d. to 6s. 2d. per lb.; Calomel, 6s. 4d. to 6s. 5d. per lb.; Yellow Oxide, 6s. 10d. to 6s. 11d. per lb.; Persulph., B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 5s. 10d. to 5s. 11d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 9d. per lb.
METHYL SULPHONAL.—8s. 9d. to 9s. per lb.
METOL.—11s. per lb. British make.
PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder
PARALDEHYDE.—1s. 4d. per lb.
PHENACETIN.—2s. 6d. to 2s. 9d. per lb.
PHENAZONE.—4s. to 4s. 3d. per lb.
PHENOLPHTHALEIN.—6s. 6d. to 6s. 9d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—98s. per cwt less 2½%.
POTASSIUM CITRATE.—B.P.C., 1911: 1s. 8d. to 1s. 11d. per lb.; U.S.P.: 1s. 11d. to 2s. 2d. per lb.
POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.
POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb. according to quantity.
POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
POTASSIUM PERMANGANATE.—B.P. crystals, 6d. per lb., spot.
QUININE SULPHATE.—1s. 8d. to 1s. 9d. per oz. bulk in 100 oz. tins.
RESORCIN.—3s. 9d. to 4s. per lb., spot.
SACCHARIN.—55s. per lb.; in quantity lower.
SALOL.—2s. 4d. per lb.
SODIUM BENZOATE, B.P.—1s. 8d. to 1s. 11d. per lb.
SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb., B.P.C., 1923—1s. 11d. to 2s. 1d. per lb. for 1-cwt. lots. U.S.P., 1s. 11d. to 2s. 2d. per lb., according to quantity.
SODIUM FERROCYANIDE.—4d. per lb., carriage paid.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—90s. to 95s. per cwt. Crystals, 5s. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 7½d. to 1s. 8½d. per lb. Crystal, 1s. 8½d. to 1s. 10d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.
SULPHONAL.—6s. 9d. to 7s. per lb.
TARTAR EMETIC, B.P.—Crystal or powder, 2s. to 2s. 1d. per lb.
THYMOL.—Puriss., 10s. to 10s. 3d. per lb., according to quantity. Firmer. Natural, 14s. 3d. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—11s. per lb.
AMYL ACETATE.—2s. per lb.
AMYL BUTYRATE.—5s. 3d. per lb.
AMYL SALICYLATE.—3s. per lb.
ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s.
BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb
BENZYL BENZOATE.—2s. 6d. per lb.
CINNAMIC ALDEHYDE NATURAL.—16s. 6d. per lb.
COUMARIN.—9s. 9d. per lb.
CITRONELLOL.—13s. 9d. per lb.
CITRAL.—8s. 3d. per lb.
ETHYL CINNAMATE.—6s. per lb.
ETHYL PHTHALATE.—2s. 9d. per lb.
EUGENOL.—8s. 6d. per lb.
GERANIOL (PALMAROSA).—18s. 6d. per lb.
GERANIOL.—6s. 6d. to 10s. per lb.
HELIOTROPINE.—4s. 9d. per lb.
ISO EUGENOL.—13s. 6d. per lb.
LINALOL.—Ex Bois de Rose, 15s. per lb. Ex Shui Oil, 10s. 6d. per lb.
LINALYL ACETATE.—Ex Bois de Rose, 18s. 6d. per lb. Ex Shui Oil, 14s. 6d. per lb.
METHYL ANTHRANILATE.—8s. 6d. per lb.
METHYL BENZOATE.—4s. per lb.
MUSK KETONE.—35s. per lb.
MUSK XYLOL.—8s. per lb.
NEROLIN.—4s. 6d. per lb.
PHENYL ETHYL ACETATE.—12s. per lb
PHENYL ETHYL ALCOHOL.—10s. 6d. per lb.
RHODINOL.—32s. 6d. per lb.
SAFROL.—1s. 6d. per lb.
TERPINEOL.—1s. 8d. per lb.
VANILLIN.—16s. 6d. per lb.

Essential Oils

ALMOND OIL.—11s. per lb.
ANISE OIL.—2s. 9d. per lb.
BERGAMOT OIL.—26s. per lb.
BOURBON GERANIUM OIL.—13s. 6d. per lb.
CAMPHOR OIL.—75s. per cwt
CANANGA OIL, JAVA.—15s. 9d. per lb.
CINNAMON OIL LEAF.—6d. per oz.
CASSIA OIL, 80/85%.—7s. 3d. per lb.
CITRONELLA OIL.—Java, 1s. 9d. per lb., c.i.f. U.K. port for shipment over 1928. Ceylon, pure, 1s. 8d. per lb.
CLOVE OIL.—5s. per lb.
EUCALYPTUS OIL, AUSTRALIAN.—2s. 2d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, Esters, 17s. per lb.
LEMON OIL.—7s. 3d. per lb.
LEMONGRASS OIL.—4s. 6d. per lb
ORANGE OIL, SWEET.—11s. 3d. per lb.
OTTO OF ROSE OIL.—Anatolian, 35s. per oz. Bulgarian, 75s. per oz.
PALMA ROSA OIL.—9s. 9d. per lb.
PEPPERMINT OIL.—Wayne County, 15s. 9d. per lb.; Japanese, 8s. per lb.
PETITGRAIN OIL.—7s. 6d. per lb.
SANDALWOOD OIL.—Mysore, 26s. 6d. per lb.; 90/95%, 16s. 6d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, October 27, 1927.

A FAIRLY active trade has been moving during the week and the forward outlook is good. Prices on the whole are unchanged and firm. Export trade also has been better and there is a good volume of inquiry in the market.

General Chemicals

ACETONE is unchanged at £63 per ton and slightly lower for large quantities; trade moderate.

ACID ACETIC continues in fair request at £37 to £38 per ton for 80%.

ACID FORMIC is in fair demand; price unchanged.

ACID LACTIC has been a moderately active market and the price is firm at £43 per ton for 50% by weight.

ACID OXALIC is firm and in good request at £30 per ton.

ALUMINA SULPHATE is very active and the price is quoted at round about £5 10s. per ton for 17/18%.

AMMONIUM CHLORIDE is unchanged at £19 per ton.

BARIUM CHLORIDE is firm and in good demand at £8 10s. to £9 per ton.

COPPER SULPHATE.—A fair demand is noted and the price is firm at about £23 per ton.

EPSOM SALTS.—In good request at £4 7s. 6d. per ton.

FORMALDEHYDE is active and the price unchanged at £40 to £41 per ton.

LEAD ACETATE is steady at £42 10s. for white and £1 per ton less for brown.

LEAD NITRATE.—Unchanged at £39 10s. per ton.

LIME ACETATE.—Unchanged.

METHYL ACETONE is quiet but firm at £54 per ton to £55 per ton.

POTASSIUM CHLORATE is firm and scarce.

POTASSIUM PERMANGANATE is in small inquiry at 6¼d. per lb. to 6½d. per lb. for B.P.

POTASSIUM PRUSSIATE is in good demand at current figures.

SODIUM ACETATE is in active request and the price is inclined to harden at £18 10s. to £18 15s. per ton.

SODIUM BICHROMATE is in good demand at 3¼d. per lb.

SODIUM CHLORATE is in fair request at £25 per ton; the forward position is firm.

SODIUM NITRITE is in better inquiry at £19 10s. per ton.

SODIUM PRUSSIATE continues firm at 4½d. per lb.

SODIUM SULPHIDE.—Unchanged.

ZINC SULPHATE.—An active business has been transacted at round about £13 10s. to £14 per ton.

Coal Tar Products

The market for coal tar products remains quiet, and there is little change in values to report from last week.

90's BENZOL is unchanged at about 1s. 4d. to 1s. 5d. per gallon on rails, while the motor quality is quoted at 1s. 1½d. to 1s. 2½d. per gallon.

PURE BENZOL is quoted at 1s. 7½d. to 1s. 8½d. per gallon, on rails.

CREOSOTE OIL is firm, and is quoted at about 7½d. per gallon on rails in the North, while the price in London is about 8½d. per gallon.

CRESYLIC ACID is unchanged, at about 2s. 2d. per gallon, ex works, for the pale quality 97/99%, while the dark quality is worth about 1s. 11d. per gallon.

SOLVENT NAPHTHA is quoted at about 10d. per gallon, on rails.

HEAVY NAPHTHA is unchanged, being worth about 11d. per gallon, on rails.

NAPHTHALENES remain steady, at about £6 15s. to £7 per ton for the 74/76 quality, and at about £8 to £8 15s. per ton for the 76/78 quality.

PITCH is unchanged and the value remains about 85s., f.o.b. U.K. ports.

Latest Oil Prices

LONDON.—October 26.—LINSEED OIL, closed quieter at occasionally 2s. 6d. per ton advance. Spot, ex mill, £30 5s.; October, £29 5s.; November-December, £29 10s.; January-April, £29 15s.; May-August, £30 2s. 6d. RAPE OIL was firm. Crude extracted, £44 10s.; technical refined, £46 10s., naked, ex wharf. COTTON OIL quiet. Refined common edible, £42; Egyptian crude, £35 10s.; deodorised, £44. TURPENTINE dull and 6d. per cwt. lower. American, spot, 37s., taken and sellers; November-December, 38s.; and January-April, 39s. sellers.

HULL.—October 26.—LINSEED OIL.—Spot to April, £30 5s. per ton, naked. COTTON OIL.—Naked Bombay crude, £33 15s.; Egyptian crude (new), £35 10s.; edible refined, £38 10s.; technical, £37 10s.; deodorised, £40 10s. per ton, naked. PALM KERNEL OIL.—Crushed 5½ per cent., £38 15s. per ton, naked. GROUNDNUT OIL.—Crushed-extracted, £43; deodorised, £47 per ton. SOYA OIL.—Extracted and crushed, £35 15s.; deodorised, £39 5s. per ton. RAPE OIL.—Crude-extracted, £43; refined, £45 per ton net cash terms, ex mill. CASTOR OIL and COD OIL unaltered.

Nitrogen Products

Export.—During the past week, the sulphate of ammonia market has remained firm. Prices range from £9 8s. to £9 10s. per ton, f.o.b. U.K. port in single bags for prompt shipment. Demand remains steady in several countries. It is understood that the stocks in producing countries are not large, despite the enormous increase in production.

Home.—Merchants report the placing of a few orders at scale prices. Deliveries are being made somewhat slowly, as manufacturers appear to be fully committed.

Nitrate of Soda.—The market continues to improve and the price has touched 18s. per metric quintal f.a.s. Chile. The United States cotton growers continue to purchase and the demand for other countries continues good.

South Wales By-Products

THERE is no material change in South Wales by-product activities. Pitch remains quiet, consumers apparently not being prepared to enter into fresh commitments just now. Crude tar is steady at 60s. to 65s. per ton. Refined tars are quiet, with coke oven tar at 8½d. to 9d. a gallon, and gasworks tar at 7d. to 7¾d. a gallon, f.o.r. maker's works, and 10d. to 1s. delivered in barrels. Crude naphthalene remains quiet at £4 10s. to £5 per ton. Heavy and solvent naphtha has little demand at 9d. to 10d. a gallon, f.o.r. maker's works. Patent fuel and coke exports remain good, while the home demand is also good and steady. Patent fuel remains at 23s. to 24s. 6d.; coke varies from 23s. to 37s. 6d.

Calcium Cyanamide

THE demand for this fertiliser for immediate delivery continues to be satisfactory. The farmers' price for 4-ton lots for November delivery is £8 12s. per ton, carriage paid to any railway station in Great Britain.

German Colour Companies Amalgamate

LEADING German manufacturing firms of fine, mineral, and earth colours are reported to be discussing amalgamation and the establishment of a German Colour Works Co. (Deutsche Farbwerke A.G.), with a capital of £750,000 to £1,000,000. This would not be in opposition to the I.G. Farbenindustrie. Indeed, it is hoped that the trust would have a financial interest in the new concern. The principal firms mentioned in regard to this new combine are: The Heyl-Beringer Co., of Berlin, the Franz Rasquin Dye Works, of Cologne-Mulheim, the Siegle Dye Works, of Stuttgart, the Vossen Brothers Dye Works, of Aachen, and the Schröder and Tadelmann Co., of Neiderlahnstein-Oberlandstein.

A German View of I.C.I.

THE German journal *Die Metallbörse*, in its issue of October 22, comments with unusual frankness on the resignation of Sir John Brunner from the board of I.C.I. The writer of the German note indulges in considerable speculation as to supposed differences of opinion, and as to the attitude of various interests towards the terms of exchange of shares. While we do not feel justified in reproducing the speculative views of an anonymous German writer, the note is one which will no doubt attract attention in Germany. With regard to Sir Alfred Mond, who is clearly viewed as the leader of I.C.I., it is stated that although he seems optimistic as to the future, he cannot, in the light of his career, be regarded as incautious. The German writer notes that the recent announcement has not affected I.C.I. shares.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

Glasgow, October 26, 1927.

THE heavy chemical market has again shown moderate activity during the past week, inquiry for export being particularly good. Prices remain on about the same level as last reported, with the exception of carbonate of potash, 96/98%, which has been reduced to £25 10s. per ton, ex wharf.

Industrial Chemicals

ACETONE, B.G.S.—Quoted £58 to £61 per ton, ex store according to quantity.

ACID ACETIC, 98/100%.—Glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80%, technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £34 per ton. Powder, £36 per ton, packed in bags, carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—Rather quiet, and quoted price now 7¾d. per lb., f.o.b., U.K. ports.

ACID CITRIC, B.P. CRYSTALS.—Now offered at 1s. 6¼d. per lb., less 5%, ex wharf.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. 9d. per carboy. Dearsenicated quality, 6s. 3d. per carboy, ex works.

ACID NITRIC, 80%.—Quoted £23 5s. per ton, ex station, full truck loads.

ACID OXALIC.—Continental material unchanged at 3¾d. per lb., ex wharf. Spot material quoted 3¼d. per lb., ex store.

ACID SULPHURIC, 144°.—£3 12s. 6d. per ton. 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality, 20s. per ton more.

ACID TARTARIC, B.P. CRYSTALS.—In little demand and price nominally at 1s. 2¼d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Spot material quoted £5 12s. 6d. per ton, ex store. On offer for early delivery at £5 5s. per ton, c.i.f. U.K. ports.

ALUM POTASH.—Lump quality quoted £8 5s. per ton, c.i.f. U.K. ports. Crystal meal, 10s. per ton less. Lump quality on spot offered at £9 per ton, ex store.

AMMONIA, ANHYDROUS.—Unchanged at about 9d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2¼d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture unchanged at £23 to £24 per ton, ex station. Continental on offer at £19 15s. per ton, c.i.f. U.K. ports; fine white crystals quoted £17 10s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—Rather easier. Now quoted £20 per ton, ex wharf, prompt despatch from mines. Spot material available at £20 15s. per ton, ex store.

BARIUM CARBONATE, 98/100%.—Continental material unchanged at about £7 10s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals quoted £6 17s. 6d. per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Contract price to consumers, £8 per ton, ex station, minimum 4-ton lots. Spot material, 10s. per ton extra. Continental on offer at £7 5s. per ton, ex wharf.

BORAX.—Granulated, £19 10s. per ton; crystals, £20 per ton; powder, £21 per ton, carriage paid U.K. ports.

CALCIUM CHLORIDE.—English manufacturers' price unchanged at £5 to £5 5s. per ton, ex station, with a slight reduction for contracts. Continental offered at £3 15s. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or £4 12s. 6d. per ton, f.o.b. U.K. ports for export.

COPPER SULPHATE.—Continental material on offer at £22 10s. per ton, ex wharf. British material quoted £23 5s. per ton, ex store, spot delivery.

FORMALDEHYDE, 40%.—On offer at £37 5s. per ton, c.i.f. U.K. ports. Spot material quoted £39 per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material on offer at about £28 per ton, ex store.

LEAD, WHITE.—Quoted £28 10s. per ton, ex store.

LEAD, ACETATE.—White crystals quoted £39 15s. per ton, c.i.f. U.K. ports; brown about £38 10s. per ton, c.i.f. U.K. ports. Spot material on offer at £42 15s. per ton, ex store spot delivery.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.

POTASH CAUSTIC.—88/92% solid quality quoted £28 15s. per ton, c.i.f. U.K. ports, minimum 15-ton lots. Under 15-ton lots, £29 10s. per ton; liquid, £15 per ton, minimum 15-ton lots. Under 15-ton lots, £15 7s. 6d. per ton, c.i.f. U.K. ports.

POTASSIUM BICHROMATE.—Unchanged at 4¼d. per lb., delivered.

POTASSIUM CARBONATE.—96/98% quality now on offer at £25 10s. per ton, ex wharf. Spot material quoted £26 10s. per ton, ex store. 90/92% quality offered from the Continent at £24 per ton, ex wharf.

POTASSIUM CHLORATE, 99/100%.—On offer from the Continent at £25 10s. per ton, c.i.f. U.K. ports for powdered quality; crystals, 30s. per ton extra.

POTASSIUM NITRATE.—Quoted £20 per ton, c.i.f. U.K. ports. Spot material available at £21 per ton, ex store.

PERMANGANATE, B.P. CRYSTALS.—Quoted 6½d. per lb., ex store, spot delivery.

PRUSSIATE (YELLOW).—Unchanged at about 6½d. per lb., ex store, spot delivery. Offered from the Continent at 6¾d. per lb., ex wharf.

SODA CAUSTIC.—Powdered, 98/99%, £19 7s. 6d. per ton; 76/77%, £15 10s. per ton; 70/72%, £14 10s. per ton, carrige paid station, minimum 4-ton lots on contract. Spot material, 10s. per ton extra.

SODIUM ACETATE.—On offer from the Continent at £18 per ton, c.i.f. U.K. ports. British material quoted £21 5s. per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised quality, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3¼d. per lb., delivered buyers' works.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 27s. 6d. per ton extra; alkali 58%, £8 10s. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 10s. per ton, ex store, minimum 4-ton lots. Continental on offer at about £8 2s. 6d. per ton, ex wharf, prompt shipment. Pea crystals of British manufacture quoted £15 5s. per ton, ex station 4-ton lots.

SODIUM NITRITE, 100%.—Quoted £19 10s. per ton, ex store.

SODIUM PRUSSIATE (YELLOW).—In moderate demand and price unchanged at about 4¼d. per lb., ex store. Offered for prompt shipment from the Continent at 4¼d. per lb., ex wharf.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption, £3 7s. 6d. per ton, ex works.

SODIUM SULPHIDE.—Prices for English material as follows:—60/62%, solid, £10 10s. per ton; broken, £11 10s. per ton; flake, £13 5s. per ton; crystals, 31/34%, £7 10s. per ton to £8 5s. per ton, according to quality, delivered your works, minimum 4-ton lots on contract. Prices for spot delivery, 5s. per ton, higher for solid, and 2s. 6d. per ton. For crystals offered from the Continent at about £9 5s. per ton, c.i.f. U.K. ports; broken, 15s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 15s per ton; rock, £10 12s. 6d. per ton; floristella, £9 10s. per ton; ground American, £9 5s. per ton, ex store. Prices nominal.

ZINC CHLORIDE.—British material, 98/100%, quoted £24 15s. per ton, f.o.b. U.K. ports; 98/100%, solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports; powdered, 20s. per ton extra.

ZINC SULPHATE.—Continental material quoted £11 15s. per ton, ex wharf.

NOTE.—The above prices are for bulk business and not to be taken as applicable to small parcels.

Lignite Distillation in New Zealand

CARBONITE, LTD., is the title of an Auckland company which has been formed to introduce the Debauche process for the distillation of New Zealand lignite. Tests carried out in Belgium on a shipment of 1 in. slack from the Waikato lignite mines proved satisfactory. A week's operations gave an average return of 11 cwt. of residual fuel per ton of coal, together with light and heavy oils and sufficient gas for the continuous heating of the retort. The residual fuel had a calorific value greater than that of untreated Waikato coal. The distilled coal yielded a nut coal suitable for marine and industrial purposes, and the fines were made into briquettes and small ovoids. The briquettes were said to be superior to those in general use on Belgian railways. It is expected that 11½ gallons of heavy oil and 2¾ gallons of motor spirit per ton of raw lignite will be obtained in operations on a commercial scale, which is stated to have been in use in Saxony for over 30 years.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, October 27, 1927.

A quietly steady trade is being put through here in the home trade section of the chemical market, and there is a fair volume of inquiry about regarding forward delivery transactions. With regard to business on export account, inquiry has been on rather a small scale and actual orders during the past week have been largely confined to moderate parcels of certain of the bread-and-butter lines of heavy chemicals.

Heavy Chemicals

In the case of prussiate of soda there has not been a great deal of buying interest in evidence, but values are steady at about 4⅝d. per lb. Nitrite of soda meets with a fair amount of inquiry, with supplies on offer at round £19 per ton. Glauber salts continue to move off in relatively small quantities at £3 5s. per ton. Caustic soda is one of the products to find a fairly active market, and quotations are firm and fully maintained at from £14 10s. to £16 10s. per ton, according to quality. Alkali also is selling comparatively freely at steady prices, about £6 15s. per ton being quoted. Chlorate of soda continues to be offered here at from 2¾d. to 2⅞d. per lb., but the demand for this has been on a limited scale. Saltcake is obtainable at £3 10s. per ton, or rather less than this, but there is relatively little movement in this section. The call for hyposulphite of soda is of moderate extent, with commercial quality on offer at £9 5s. per ton and photographic at about £16 5s. per ton. Bichromate of soda keeps steady and continues to meet with a fair volume of inquiry at round 3d. per lb. The demand for sulphide of soda is rather quiet but prices are maintained, commercial being quoted at £8 5s. to £8 10s. per ton and the 60-65 per cent. concentrated solid at about £10 10s. Bicarbonate of soda is in moderate request and keeps steady at £10 10s. per ton. Phosphate of soda is on the quiet side but is well held at up to £12 15s. per ton.

In the potash group bichromate is a steady section at 4½d. to 4⅝d. per lb. and a fair business has been reported. Caustic potash continues to attract a fair amount of attention and quotations are firm at round £30 per ton. Carbonate of potash is in quiet demand and offers are maintained at about the recently reduced rate of £26 5s. per ton. Permanganate of potash has an easy tendency although there has been little actual change, commercial being on offer at 5⅛d. per lb. and B.P. material at 6¼d. to 6½d. per lb., with business on the quiet side. The demand for chlorate of potash is on a moderate scale and values are maintained at 2¾d. per lb. Yellow prussiate of potash is obtainable at 6½d. per lb., or thereabouts, and a quiet trade is being put through.

A moderate demand for sulphate of copper for shipment has been reported at an average figure of £24 10s. per ton, f.o.b. Arsenic continues to attract a fair amount of buying interest and, with supplies on the short side, prices are firm at from £18 5s. to £18 10s. per ton, at the mines, for white powdered, Cornish makes. There is not much movement in the case of nitrate of lead but at round £38 per ton values are pretty well where they were. The demand for the acetates of lead is of a limited character and the price tendency is easy, with brown quoted at £39 10s. and white at £41 per ton. The acetates of lime remain very firm, grey being quoted this week at £16 10s. to £17 per ton and brown at about £10 10s. per ton.

Acids and Tar Products

There has been rather more activity in oxalic acid and prices are fairly firm at 3¼d. to 3⅜d. per lb. Tartaric acid is maintained at about 1s. 3d. per lb., although the demand for this continues quiet. Citric acid is still quoted at 1s. 6¼d. to 1s. 6½d. per lb., but here again business is slow. Acetic acid is steady and meets with a fair inquiry at £67 per ton for glacial and £36 10s. to £37 for the 80 per cent. commercial quality.

Of the tar products pitch is fairly steady at round £4 2s. 6d. per ton, f.o.b., and inquiry is rather more active. Solvent naphtha remains weak and is now quoted down to 11d. per gallon, buying interest being poor. Creosote oil is steady and in fair demand at 7½d. to 7¾d. per gallon. Carbolic acid crystals are quiet and easy at about 7½d. per lb., but the crude material is steady at 2s. 6d. to 2s. 7d. per gallon.

The Producers' Control Board

Tin-producing companies in Malaya and important tin-mining interests in Malaya decided at recent private meetings in London to form a Tin Producers' Control Board. Mr. E. J. Bryne, a director of Kamuntung Tin Dredging, Ltd., who is taking a prominent part in the formation of the Board, explaining the result of the meetings, says that the objects of the Tin Producers' Control Board will be primarily to establish a closer and more equitable relationship between tin producers, tin concentrates, smelters and tin consumers. The tin producers have no desire to raise the price of tin to a level which would be unsound commercially. On the other hand, it is not their intention to allow the price of metal to fall to such a level as would not give an adequate return for the capital and risks involved in tin mining propositions. This would ultimately reflect to the detriment of the producer, the smelter, and the consumer since there would be no incentive to prospect for new tin-bearing lands, or to provide capital for their working equipment. Unless this is done, the gradual but certain diminution in the already proved tin-bearing areas, would cause the price of tin to rise to a figure which would restrict consumption. The Tin Producers' Control Board would not in any way interfere with the manner in which tin companies managed their affairs, or advocate any combination or other financial arrangements for the collective selling of tin concentrates. So far, operations are being confined to uniting all tin mining companies situated in Malaya, Burma, Siam, and Nigeria, but steps will be taken immediately to ascertain the views of the Dutch East Indies and the Bolivian producers.

Output of Portland Cement in 1926 in U.S.

Statistics relating to the Portland cement industry in 1926 compiled by the Bureau of Mines, Department of Commerce, from the final returns of the producers for the year, confirm the estimates published by the Bureau of Mines early in January, 1927. Production of Portland cement in 1926, 164,530,170 barrels, was the largest quantity manufactured thus far in any year, exceeding that in 1925, the next highest year in production, by 2 per cent. Shipments of Portland cement from mills in 1926 amounted to 162,187,090 barrels, valued at $277,965,473, an increase of 3 per cent. in quantity and a decrease of 0·2 per cent. in gross value. The average price per barrel in bulk in 1926 was $1.71, a decrease of 6 cents per barrel as compared with 1925. The commercial capacity for production of finished Portland cement of the 140 plants active at the end of 1926 is estimated at 204,400,000 barrels. This total includes, besides increased capacity due to extensions and improvements at old plants, approximately 3,500,000 barrels capacity for finished Portland cement of three new plants that began operating during the year and are located in California, Ohio, and Pennsylvania. The total production for the year 1926 was 80·5 per cent. of the indicated capacity at the close of the year. The corresponding figure for 1925 was 83·5 per cent.

Chemical Enamels, Lacquers and Finishes at the Motor Show

An increase was observed at the Motor Show this year in the number of cars finished with cellulose lacquers, while leather substitutes have also increased in popularity. In addition to Belco Finishes exhibit, which was recently described in The Chemical Age, Pinchin Johnson and Co., Ltd., were showing a car body and panels finished by Vulcose, and Gripoloid finish for wood. Pyroxylin spraying lacquers, fillers and polishing pastes were displayed by Thorley and Knight, Ltd., of Birmingham, while nitrocellulose spraying lacquers were seen on the stands of Postans and Morley Brothers, Ltd., and Gittings and Hill.

Among other firms exhibiting were Robert Ingham Clark, who showed cellulose enamels, Cellon (Richmond), Ltd., Hadfields (Merton), Ltd. Certain firms, including Reckitt and Sons, Ltd., and the County Chemical Co., Ltd., were showing special cleanser and polish for cellulose enamels and lacquers.

Company News

AYRTON, SAUNDERS AND CO.—A dividend of 7½ per cent. is announced for the past year.

OLYMPIC PORTLAND CEMENT CO.—The directors have declared an interim dividend of 5 per cent. in respect of the year 1927, being at the same rate as a year ago.

STANTON IRONWORKS CO.—An interim dividend is announced on the ordinary shares of 4 per cent. actual, free of tax, on account of the year ending March 31 next, payable on December 10.

SILICA GEL CORPORATION.—This American subsidiary of the Davison Chemical Co., will issue $1,700,000 6½ per cent. five year notes, which have been underwritten by a syndicate headed by the Century Trust Co., and Stein Brothers and Boyce. It has also been arranged to sell $500,000 no par common stock to a group identified with the directorate. The debentures will be guaranteed principal and interest by the Davison Chemical Co.

LEWIS BERGER AND SONS.—For the year to July 31 last the profits, including dividends received from subsidiary companies, amounted to £114,679, which compares with £60,099 for the preceding year, when no dividends from the associated companies were included, with the exception of £5,000 from the South African company. A balance dividend of 5 per cent. is recommended, making 10 per cent. for the year, or the same as for 1925–26, while the carry-forward is increased from £25,634 to £60,201.

ERINOID, LTD.—The trading profits for the year ended August 31 last amounted to £26,999, and, after allowing for company charges and depreciation of plant and machinery, the net profits are £17,069, which, together with the amount brought forward, and the dividend on shares in the Compagnie Francaise de l'Omnilith, leaves an available balance of £25,081. The directors recommend a final dividend of 4 per cent., making 7 per cent. for the year (less income-tax at 4s. in £), placing to general reserve £1,547, to taxation reserve £2,500, to staff fund £250, carrying forward £6,992. The report states that during the year the directors had the opportunity of borrowing £10,000 on favourable terms. This, together with the surrender of the capital redemption policy, enabled them to pay off debentures, resulting in a substantial annual saving of interest. In view of the increase of business in the last few months of the financial year, the directors considered it desirable to issue the balance of share capital, which they did at a premium of 2s. 3d. per share.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

PHARMACEUTICAL PRODUCTS, ETC.—A firm of general importers and manufacturers' agents in Bombay are open to undertake the representation of British manufacturers in the Bombay Presidency. (Reference No. 344.)

GLYCERINE.—The Director General, India Store Department, Branch No. 10, Belvedere Road, Lambeth, London, invites tenders for 45 tons of glycerine for the manufacture of nitroglycerine; tenders due November 8. Specifications, etc., from the above, at 5s. per set.

AGENTS SERVICES OFFERED.—H.M. Consul at Sao Paulo, Brazil, reports that a firm of agents in that city are desirous of obtaining the representation of a British firm handling the following classes of goods:—Black and galvanised sheets, all non-ferrous metals in manufactured forms, caustic soda, soda ash and other industrial chemicals. linseed oil, paints and varnishes. (Reference No. 363.)

Tariff Changes

CANADA.—By a recent ruling of the Canadian Board of Customs aniline or coal tar dyes soluble in water, in liquid form, may enter Canada free of duty. These commodities are granted duty free under tariff item 203, which provides for aniline or coal tar dyes in bulk or in packages not less than one pound in weight.

New Chemical Trade Marks

Applications for Registration

This list has been specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to November 12, 1927.

481,844. Class 1. Salts used in the preservation of hides and skins. The Salt Union, Ltd., Colonial House, Water Street, Liverpool; salt manufacturers. June 23, 1927.

MONSOLA.

483,675. Class 2. Chemical substances used for agricultural, horticultural, veterinary and sanitary purposes. 483,676. Class 3. Chemical substances prepared for use in medicine and pharmacy. The Mond Staffordshire Refining Co., Ltd., 47, Victoria Street, London, S.W.1; merchants. August 31, 1927. (To be Associated. Sect. 24.)

MONDOL.

483,740. Class 2. Chemical substances used for agricultural, horticultural, veterinary and sanitary purposes. 483,741. Class 3. Chemical substances prepared for use in medicine and pharmacy. The Mond Staffordshire Refining Co., Ltd., 47, Victoria Street, London, S.W.1; merchants. September 2, 1927. (To be Associated. Sect. 24.)

Opposition to the Registration of the following Trade Marks can be lodged up to November 19, 1927.

"ERGAN."

481,015. Class 1. Chemical substances used in manufactures, photography or philosophical research, and anti-corrosives, but not including preparations of asbestos or materials for preventing radiation of heat, and not including any goods of a like kind to any of these excluded goods: I.G. Farbenindustrie Aktiengesellschaft (a Corporation organised according to German laws), Mainzer-Landstrasse 28, Frankfort-on-Main, Germany, manufacturers. May 26, 1927. (To be Associated Sect. 24).

"RONSARD."

484,073. Class 4. Raw, or partly-prepared, vegetable, animal, and mineral substances used in manufactures. Fevre et Cie, 10, Rue Lincoln, Paris, France, quarry owners. September 21, 1927.

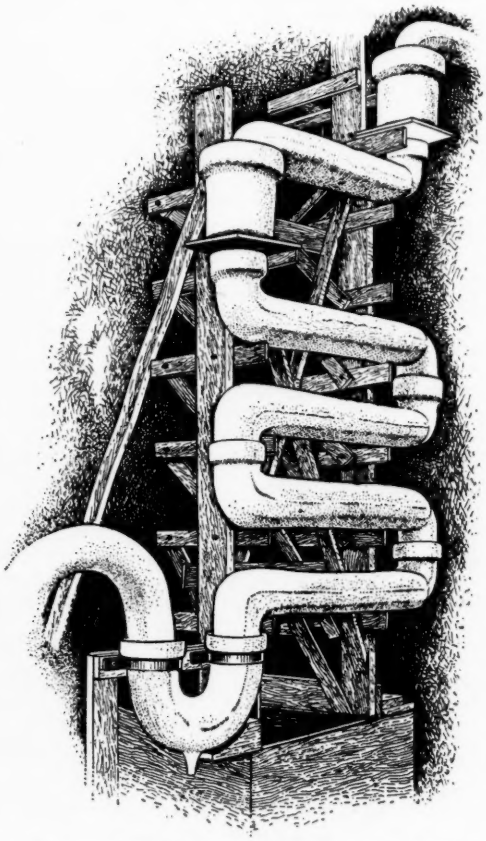
The Dead Sea Concession: No Definite Arrangement

WITH regard to the rumours that have been current relative to the Dead Sea Concession, a representative of THE CHEMICAL AGE was informed at the Colonial Office that negotiations were still in progress and that no official pronouncement could be made yet. Support was not given to statements that had been made to the effect that, although no contract has been signed, the concession had been granted to I.C.I. It is possible, however, that applicants who are stated to suppose themselves likely to be granted a concession might perhaps let the rights of working to an already established company; though this would not mean that such company had been granted the concession.

It was further suggested that the delay in bringing matters to a conclusion had been caused by the holding over of certain points of detail from earlier in the negotiations. Interviewed by a representative of the *Daily News*, Sir Alfred Mond said that if the scheme became a considerable commercial proposition it would be beneficial to the development of Palestine by creating on the spot an agricultural fertiliser of importance. A long time would elapse before the Dead Sea area would be able to dominate the potash markets of the world. He was prepared, he stated, to explore the situation and form some opinion of its ultimate commercial value.

THE CONSUL-GENERAL AT LOURENCO MARQUES informs the Department of Overseas Trade that the Post Office of Portuguese East Africa has intimated that letters, etc. intended for Lourenço Marques, but incorrectly addressed "Delagoa Bay," will in future not be delivered, but will be returned to the senders

The "VITREOSIL"



COLUMN OF "VITREOSIL" ABSORPTION VESSELS.

System of HYDROCHLORIC ACID ABSORPTION

THESE VESSELS set up Vertically one above the other can be thoroughly Water Cooled.

Economies of Floor Space and Efficiency of Operation are secured. There are no submerged joints.

In this System an intimate contact of the gas with the liquid is secured by means of the liquid curtain formed by the drops falling from the central depression and through which all the gas must pass.

Let us know your Problems

WRITE FOR DESCRIPTIVE LITERATURE

Specialists in Chemical Works Plant

SOLE MANUFACTURERS

THE THERMAL SYNDICATE, Ltd.

VITREOSIL WORKS

WALLSEND-ON-TYNE, ENGLAND

LONDON DEPOT: 28 Victoria Street, S.W.1

AND AT NEW YORK *and* PARIS

Telephone Nos. 42 & 43 Wallsend. *Telegrams: "Thermal, Wallsend"*

ABC Code, 5th & 6th Editions, & Bentley's used

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

WARD (H. W. DUDLEY), LTD., Watling Street, Fenny Stratford, Bletchley, chemical manufacturers. (C.C., 29/10/27.) £32 11s. 10d. July 28.

London Gazette, &c.

Company Winding Up

CORBYN STACEY AND CO., LTD. (C.W.U., 29/10/27.) Winding up order, October 18.

Company Winding Up Voluntarily

PREMIER LUBRICANTS, LTD. (C.W.U.V., 29/10/27.) By special resolution, September 30, confirmed October 17 B. Bowles, 42, Finsbury Square, London, E.C.2, incorporated accountant, appointed as liquidator.

Application for Discharge

FREEMAN, John William, chemical manufacturer, Bradshawfield Mill, Bread Street, Bolton, trading as the MENZUM CHEMICAL CO. (A.F.D., 29/10/27.) Hearing, November 16, 10.30 a.m., Court House, Mawdsley Street, Bolton.

Receiverships

LESLIE ALLAN AND CO., LTD. (R., 29/10/27.) G. A. Watson, of 24, King Street South, Rochdale, was appointed receiver and manager on October 8, 1927, under powers contained in debenture dated May 28, 1924.

MONTAGU AND SONS, LTD. (R., 29/10/27.) J. Dawson, of 200, Hornsey Road, N.7, was appointed receiver on August 11, 1927, under powers contained in mortgage dated September 20, 1923. A. B. Marshall of the same address ceased to act in the above capacity on August 11.

SUTER CAMPBELL OILS, LTD. (formerly SENTINEL OILS, LTD.). (R., 29/10/27.) R. P. Chambers, C.A., of 60, Queen Victoria Street, E.C., was appointed receiver and manager on October 15, 1927, under powers contained in debentures dated December 18, 1925.

New Method of Glycerine Production

THE Eastern Alcohol Corporation, owned jointly by the du Pont Co. and the National Distillers Products Corporation of the United States, has recently announced the development of a new process for the recovery of glycerine from fermented molasses mash (produced in the manufacture of alcohol) under United States patents No. 1,626,986, by S. K. Varnes, and No. 1,627,040, by J. W. Lawrie, both applied for in June, 1922, and issued on May 3, 1927, under assignment to the du Pont de Nemours Co. in order to render that company independent of soapmakers' glycerine for explosive manufacture. Fermented molasses mash contains about 3 per cent. of glycerine and 6 per cent. of alcohol, and after the alcohol has been distilled off and the remaining liquor concentrated, the glycerine content is about 15 to 18 per cent. By methods described in the above-mentioned patents, it is claimed that 92 to 98 per cent. of the glycerine is recovered, mainly by spraying the concentrated liquor in the form of a fine mist in a special still, together with an inert heated gas or superheated steam, under suitable conditions of temperature and pressure, and then recovering the glycerine by condensation. The capacity of the Eastern Alcohol Corporation's plant is said to be about 10,000,000 gallons of alcohol per annum, necessitating the use of some 30,000,000 gallons of fermented mash. From this it is estimated that, with maximum yields, nearly 50,000,000 lb. of glycerine could be recovered, that is, nearly half the present production of glycerine from soap-making plants in the United States.

New Company Registered

THE SILVER LEAF MINING SYNDICATE (CANADA) (1927), LTD. Registered as a "private" company, on October 15. Nom. capital, £30,000 in £1 shares. To acquire the business of mine and metalliferous land, silver mine and mineral right owners, and miners and exporters of lithium ores, lepidolite, spodumene, montebrasite, amblygonite and other mineral and chemical ores heretofore carried on by the Silver Leaf Mining Syndicate (Canada), Ltd., near Winnipeg, Canada, and elsewhere, and to adopt an agreement with the said company and J. Smith, its liquidator; to carry on the business of metallurgists, metallurgical and manufacturing chemists and druggists, etc. Secretary, T. P. Balaam, 3, Bull Royd Drive, Allerton Road, Bradford.

Escape of Acid Fumes from Works

THE escape of acid fumes at St. Philip's Marsh, Bristol, from the Avon Manure Works, has just been considered by the Bristol Health Committee. In the result it was shown that the Government Inspector who had investigated the matter was satisfied that the fumes were restricted as far as possible, and it was stated that the emission of strong fumes which had been recorded on September 23 might not occur again for 20 years. In his report, the Chief Sanitary Inspector (Mr. J. A. Robinson) said the business consisted of the manufacture of artificial manure and fertilisers, the output running into many thousands of tons a year. Sulphuric acid was manufactured as an integral part of the process, though not as a commercial product. After being idle for four months for the purpose of general overhaul and repairs, the plant was re-started on September 20. Owing to the extremely wet summer, the brickwork of the ovens and flues had absorbed so much moisture that the process did not proceed with the usual speed, with the result that for several hours on September 23 there was a considerable low level escape of gas. This was above the legal limit, but was quite unavoidable and not due to neglect. The damage done to vegetation in the neighbourhood was obvious but not lasting. The Avon Manure Works have been established about 70 years, and the process of manufacturing sulphuric acid referred to has been carried on for forty years. About every three years it is necessary for operations to be suspended for overhauling the plant, and only when it is re-started is it possible for such an accident to happen. On this occasion it was unavoidable, as the weather conditions were so unfavourable. It was a still day with little wind, and during the afternoon there was a great deal of rain, with the result that the fumes mingling with the damp atmosphere were deposited on the vegetation in the form of dilute sulphuric acid. Attention was called to the matter by the St. Philip's Vigilance and Improvement Committee.

Benn Brothers' Other Journals

THE CABINET MAKER.—Special Wycombe Number: What Wycombe is Making; High Wycombe Transport Facilities; Dry Rot in Timber; Sixth National Cost Conference.

DISCOVERY.—The Choco Indians of Panama; Swedish Expedition's Report; "A Bird Census in the Alps," by E. M. Nicholson; "Central Heat" for Crops; First Details of a New Development; Broadcasting and the Press.

THE ELECTRICIAN.—Manufacturers' Number. "The Design of Small Coil Windings," by R. C. Woods; "Training Personnel for Industry," by A. P. M. Fleming; "High-Speed Turbo Generators," by William Sharp; "How I Would Sell Electric Cookers," by Mrs. C. Frederick.

THE EXPORT WORLD.—Great Britain's trade position analysed by Lord Gainford; Insights into British Industry—V: Billiard-Table Manufacture.

THE FRUIT GROWER.—Imperial Fruit Show Issue: "The Song of the Show," by Sir W. Lobjoit; Guide to competition and trade features; Growers' Day Programme.

GARDENING ILLUSTRATED.—Too Little Known Apples; New Plants at Vincent Square; The Best Gladioli of the Year.

THE GAS WORLD.—Capital Charges and Reserves in the Gas Industry; Wrought Iron Tubes; Advance in Gas Fires.

THE HARDWARE TRADE JOURNAL.—Preparations for the Christmas Trade: Utility Gifts for the Festive Season; The Marking of Imported Brass Taps; Cutlery and Plate Notes; The Radio Counter.

THE TIMBER TRADES JOURNAL.—Full story of the Kara Sea Expedition; The Plywood Trade at Dinner; Railway Rates for Timber; Deterioration in Transit; Temperature and Saw-Milling.